MEETING ATTENDEES

City of Raleigh PBC+L/AECOM
Critical Public Safety Facilities Project
Session: Workshop 5 – Site and Massing Workshop

A R C H I T E C T U R E
PBC+L

DATE: October 01, 2012

A meeting was held on October 01, 2012 at the Convention Center.
Attendees included the following:

Name:	Company	Email Address	Phone
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Craig Schulz	RWECC	craig.schulz@raleighnc.gov	919-996-5013
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The following items were discussed:

October 1, 2012, Workshop
Raleigh CPSF Programming, Blocking Concepts and Site Concepts
The space program and power point presentation for the morning as well as afternoon session is attached to this conference summary for reference.

Program Review

1. The RF equipment building may be back fed from the main building for electrical and UPS if it is reasonably close to the main building. If it is not close to the main building then additional space may be required for electrical.
2. The Lobby space has not had any changes since the last programming session.
3. A question was raised about planning for growth in the media area. The City Public Affairs office should weigh in on this. This space can also be used for training if space is provided for chair and table storage.

ECC Program

4. The City of Raleigh Space Standards (2008) were utilized to classify office sizes. It is believed the OBA standards were utilized by the Lightner study. The ECC requested a re look at several of the spaces and believe they may have been misclassified.
5. Training file storage needs folders for 150 employees plus past employees. Need several 5 drawer file cabinets.
6. CALEA file storage will require 2 five high file cabinets, plus one more for future.
7. Personnel file storage needs 5 cabinets plus maybe 2 more for future.
8. The Quartermaster storage is where the ECC will store headsets and items that need to distribute to employees.
9. Vendor storage is for spare parts under vendor control. Another storage component is for parts that the ECC owns.
10. IT workspace/breakout area has been added to the ECC program.
11. The Spare Parts storage off of ECC Operations has been renamed to Supervisor Storage.
12. It was requested that 1 more vending machine be added in the staff support area for a total of 3.
13. The Critical Testing center can be a shared space with the Non Emergency Call Center.
14. AECOM asked if the Muster Room needs to be dedicated or if it can be shared. The ECC will need to review this.
15. The ECC will need an outside break area in secure area. Possibly balcony, depending on location of ECC.
16. Five pantries – 1 per shift - have been added.

City EOC Program

17. A Deputy Director was added in place of 2 workstations.
18. The Breakout rooms have been reduced from 3 medium to 2 medium.
19. The Classroom could be a shared space with the Press room. The EOC class room could be eliminated and the Press room made a bit larger.
20. The Non Emergency Call Center can also serve Pre Hire Testing.
21. Table chair storage may need to be larger than 100 SF.
22. Map and plan storage room has been added to the program.

Traffic Control Center Program

23. TCC requested their space be immediately adjacent to the Data Center for accessibility to their racks.
24. TCC can share a plotter with the EOC.

Shared Staff Support Program

25. Will need to consider bunkrooms if EOC classroom is to be housed in the press room space.
26. A range was previously discussed as needed for activation food preparation. Range should include a commercial hood.
27. "8.05.03 - Drink Fountain" should be indicated as "Water Fountain". **Information Technology Program**
28. Data Center NOC Analysts (3 positions now) will be adding shifts. These are accounted for in the 3 future positions.
29. System Analyst will have 8 positions with 2 future staff on second shift, for a total of 10 positions.
30. Data Base Analyst will have 6 positions with 3 future positions on 2nd shift, for a total of 9 positions.
31. Network Engineer will have 3 positions with 4 future positions on second shift – 2 of the future positions will be on the second shift and will share a workstation.
32. Network Intern will be 1 position with one on 2nd shift.
33. Security analyst will change to 1 current position and 3 future positions, for a total of 4 positions.
34. Some vendors are long term contracted vendor positions and are counted as City employees.

35. The IT Vendor program area needs to move near data center. Revise counts to (2) Current, (4) Future and (6) Total. Consider using a "Bullpen" arrangement.

Data Center Program

36. Some racks have been deleted and some added since the last programming exercise. The program will keep the rack count at 160 for now.
37. Vendors need cubicle or vendor work area near data center and vendor set up area. Need approximately 6 cubicles for this. Could be a bullpen area with center table for collaboration.
38. The IT storage has been bumped up to 350 SF.

Facilities Program

39. No changes needed.
40. Need about 120 SF storage area for spare items.

Building Systems and Support Program

41. Now have 3 custodial closets – one on each floor.
42. A separate washer and dryer area and recycling closets have been added.
43. Need dry bulk storage for contracted custodial company in the building that is secure.

Receiving Area Program

44. Receiving area is just where the items come in. There is an additional 800 square feet of storage where the items will move once unloaded.
45. Will need a storage space for a forklift and charging station.

RF Building Program

53. Will need a workspace for small desk.

Northeast District Police Program

54. The NE District believes the public parking can be reduced to 30 spaces. These could be used during an activation as well.
55. Police will confirm if they need a Community room for 100 people.
56. They will also confirm 2 Lieutenants will share 1 office.

Parking

57. Public parking can be reduced to 30 for police and can be used for activation when needed.
58. The City ECC and EOC will explore if they can stagger shifts during and activation.

Adjacencies and Concept Blocking Diagrams - Refer to Adjacency Diagrams in the Power Point presentation.

1. The ECC Admin does not have to have strong connection to ECC Ops. Admin could be on another floor; however, would like to maintain face-to-face connection with staff.
2. The Police Armory would be better located to be near the locker rooms or bulk storage. It is used for temporary storage of weapons
3. The Facilities conference room can sometimes become like a Facilities emergency operations center during a City activation or other significant event.
4. Add the unpacking area to the IT systems, Network adjacency diagram.
5. In the TCC program, the stronger connection is between the actual traffic control center and the TCC racks.

Blocking and Stacking Concepts – Refer to Blocking Concepts in the Power Point presentation.

1. Option 1 – 3 stories, ECC on third floor, City and County EOCs on 2nd floor
2. Option 2 – 3 stories, City EOC on third floor and ECC on 2nd, without Wake Co. EOC. Could also do a variation of this option to put the City EOC on the 2nd floor with ECC Admin also on the second floor with City EOC.
3. The ECC is the most secure area, thus it makes sense to put on the third floor.
4. One option could be to put the Data Center on the 2nd floor to reduce the length of feeds to critical equipment in ECC. Could leave UPS room on the 1st floor in this case.
5. Option 3- Lower level option. Has a lower level walkout basement area for building systems. First floor would be EOC, Data Center, IT spaces and TCC. ECC would be on the top level.

6. Facilities stated they like being close to the lobby for security control during an activation. They would be isolated in Option 3 during and activation.
7. The City would like to maximize daylighting for ECC spaces.

Site Options - Refer to Site Options in the Power Point presentation.
1. The building blocks are assumed to be same for all options. This block may or may not have Wake County EOC.
2. Option A has 340 surface parking spaces with 90 activation parking spaces on grass pavers. This totals the approximate parking needs with Wake County EOC.
3. Option B has 263 surface parking spaces and 122 activation parking spaces . This totals approximate parking needs for the facility without the Wake County EOC.
4. Option C adds the District Police. The project will have to move to a structured secure deck for this option. May need to use commercial property for trucks to pull in and out. Option C would work well with the lower level stacking option. Parking includes 120 spaces per floor for the parking deck, 121 spaces for police surface parking and 102 activation parking spaces nearing the 570 count estimated by the October 17th program.
5. Option D shows the Police adjacent to a secure parking deck. The CPSF is on the east side of site. There are 400 parking spaces in the secure deck, 48 public parking spaces and 122 activation parking spaces. Approximate total is 570.
6. Major in and out site access will be off of Westinghouse Road.
7. Cleared activation parking should be about 30 feet away from building.
8. Parking without Wake County is approximately 310 spaces. With Wake County, parking needs are about 430.
9. The District Police station on the site provides additional security protection.
10. The parking options presented include all agency shifts changing at one time.
11. Structured parking provides better security and is more sustainable for stormwater control.
12. Shared access with the commercial neighbors will not occur at the same time of day.
13. If the e Community Room on the Police facility is eliminated, the site will become more secure.

AFTERNOON SESSION - Refer to Technology, LEED and Cost Overview in the Power Point presentation.

Building Technology
1. Data center cooling will utilize the hot aisle /cold aisles approach.
2. Life cycle costs need to justify options particularly raised floor air distribution for the data center.
3. Modularity of technology systems with future build out will help justify this underfloor distribution system.
4. The City stated Apple is not using underfloor air distribution for their latest data center design.
5. Hot spot rack chilled water cooling will be researched to determine effect on energy and performance.
6. Central plant equipment will have a redundancy of N+1. CRAC units serving data center will have a redundancy of N+2.
7. Because an HVAC system can account for 40%-60% of the energy used in commercial buildings, there is a high priority on energy efficient systems and equipment.
8. The Data Center may use lockable racks instead of caging for security.
9. The project may utilize instantaneous water heaters since hot water demand will typically not be high. Solar hot water heating should be looked at. Also look at gas heat efficiency. Look at what is more efficient.
10. The NC Dept. of Insurance will require full wet pipe fire suppression in the building. So the data center and UPS room will need clean agent and double interlock preaction systems.
11. The City does not want clean agent in the ECC or EOC ops floor.
12. Look at LED versus fluorescent lighting and where it makes sense to use.
13. Power distribution and redundancy concept reflects a Class F3 (Tier 3) infrastructure.
14. The project will likely use N+1 generators and parallel controls.

15. The project will likely use 2 UPS systems with 2 independent paths so that can isolate 1 path for maintenance and still have 1 path still live. There will be 2 independent power paths to the data center. There will also be 2 buses and 2 power supplies for the racks. Facilities requested bypass be included for maintenance.
16. Battery monitoring could be utilized to have to see how the UPS batteries are performing.
17. The generation system should start within 10 seconds.
18. The UPS system(s) will have a maintenance bypass. If ATSs are used they will also include maintenance bypass.
19. Could use dual controls for the system. Many system failures happen due to the controls. It will depend on how big the system is as to whether the system will require a transfer switch or paralleling gear.
20. Five to seven minutes may be too long for an emergency power start up after a utility outage. ECC requests 30min battery.
21. The City would like the ECC dispatch floor fed half from UPS A and half from UPS B. If one fails, will not lose all dispatch positions.
22. The City likes diesel fuel for the generators. There will be a belly tank and large fuel storage tank with redundant fuel pumps.
23. The ECC currently has on hand 5 days worth of fuel.
24. Look at the life cycle costs photovoltaics.
25. The Convention Center has PV generation. They are providing about 12% of the load with the current array.
26. The City waste water plant has PV and power is sold from the PV generation. The pay back is believed to be about 35 years.
27. The typical 911 technologies that may be used were reviewed.
28. The City will likely provide the 911 switch.
29. The ECC is thinking that they will replace the CPE and CAD. They are also thinking they will go with IP based consoles.
30. The ECC will need to go to P25 standards. The CAD and radio will have to be replaced when the ECC goes to P25 and the State goes to Next Gen.
31. The project will also need to consider dispatch and technical furniture systems.
32. A geographic data base system will likely be required.
33. For the EOC, plan for PBX, IT , Geofile and AV display systems. Consider satellite and other specialized systems. A consolidated City and County EOC will require satellite system.

Sustainability
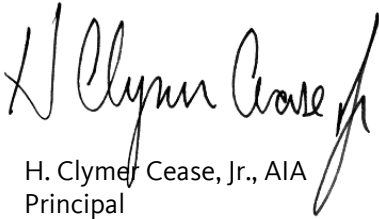1. An overview of LEED 2009 and potential LEED credits was presented.

Cost Overview
1. Average and mean costs were presented for police facilities and ECC/EOC facilities.

Next steps
1. The project will need to get a handle on technology in order to estimate these budget numbers. The City will set up meetings with AECOM and the technology stakeholders.
2. The project also needs to get a better handle on parking. The City needs to decide on policy items. Can reduce parking to 325 spaces (263 plus half of the 122 activation parking) for Option B.
3. PBCL/AECOM will test Option C with the deck located in the center of the site.
4. The City stated to design for 120 mile per hour sustained winds.
5. The City will be looking for F3 criteria for redundancies, similar to the Lightner project.
6. The project will need to factor in costs for any additional design services.
7. For the next workshop, the design team will have the revised program; revised concepts that better fit the site options; massing diagrams; site options further refined with parking; revised costs including budget for IT systems.

The above represents the author's understanding of the content of discussion held during the meeting. Any corrections or additions are to be forwarded to PBC+L within seven (7) days of receipt. If no written objections are received within this period the above will become the official record of decisions made in this meeting.

Submitted by:
PBC+L/AECOM

H. Clymer Cease, Jr., AIA
Principal

cc: File

CITY OF RALEIGH
CRITICAL PUBLIC SAFETY FACILITY

01 October 2012

City of Raleigh

Pearce Brinkley Cease + Lee | AECOM

Adjacency Diagrams

LOBBY

ECC ADMIN

FACILITIES

CITY EOC

WAKE CO. EOC

BUILDING SYS

ECC STAFF SUPPORT

RECEVING

IT

DATA CENTER

ECC OP.

NE POLICE DISTRICT STATION

SHARED STAFF SUPPORT

TRAFFIC CONTROL

LEGEND

PRIMARY ADJACENCY

SECONDARY ADJACENCY

TECHNOLOGY ADJACENCY
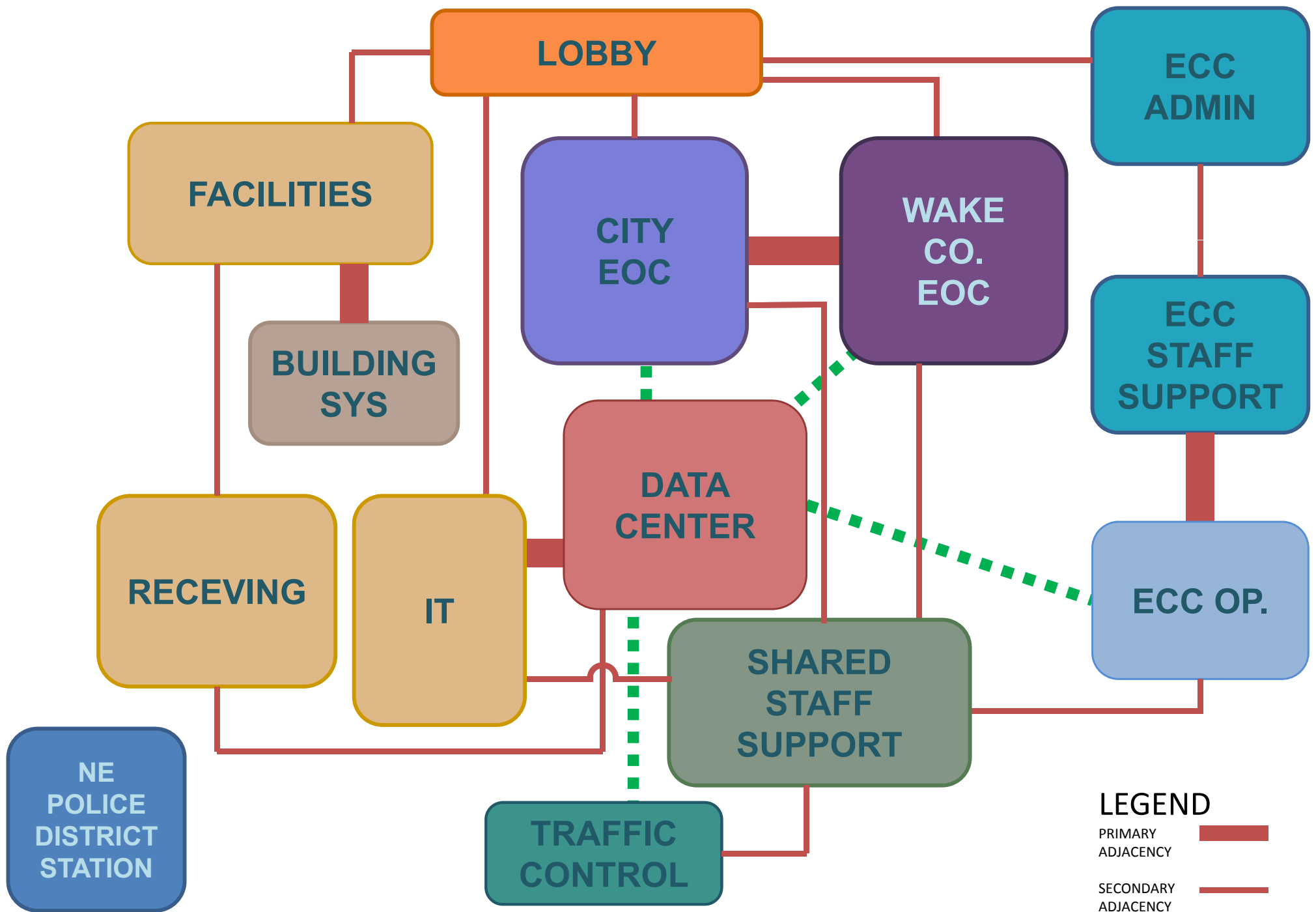
Overall Adjacency Diagrams

Emergency Operations Centers Adjacency Diagram

LOBBY

PRESS ROOM

JIC

NON EMERGENCY CENTER

WAKE CO EM OFFICE

CITY EM OFFICE

COPY

BREAK OUT

CITY EOC

WAKE COUNTY EOC

COPY

BREAK OUT

POLICY ROOM

SHARED STAFF SUPPORT

CONF.

SCIF

STOR

STOR

LEGEND

PRIMARY ADJACENCY

SECONDARY ADJACENCY

TECHNOLOGY ADJACENCY

BUILDING CIRCULATION

ECC ADMISTRATION

ADMIN CONF.

MUSTER

REST ROOMS

BREAK ROOM

DATA CENTER

CLASS ROOM

TOUR VEIWING

OPERATIONS

SUPERVISORS OFFICE

LIVE TRAINING

LEGEND

PRIMARY ADJACENCY
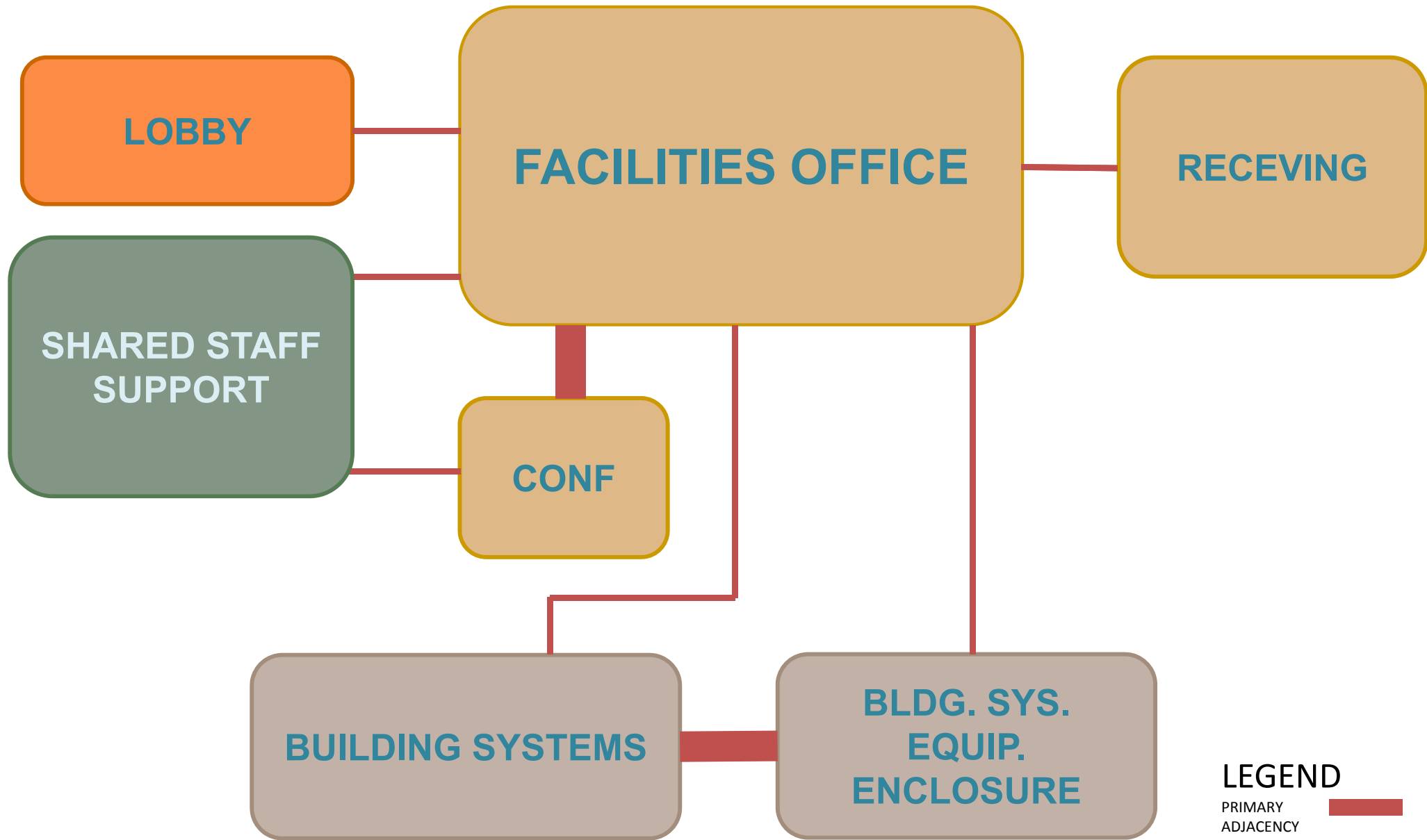
SECONDARY ADJACENCY

TECHNOLOGY ADJACENCY

Emergency Communication Center Adjacency Diagram
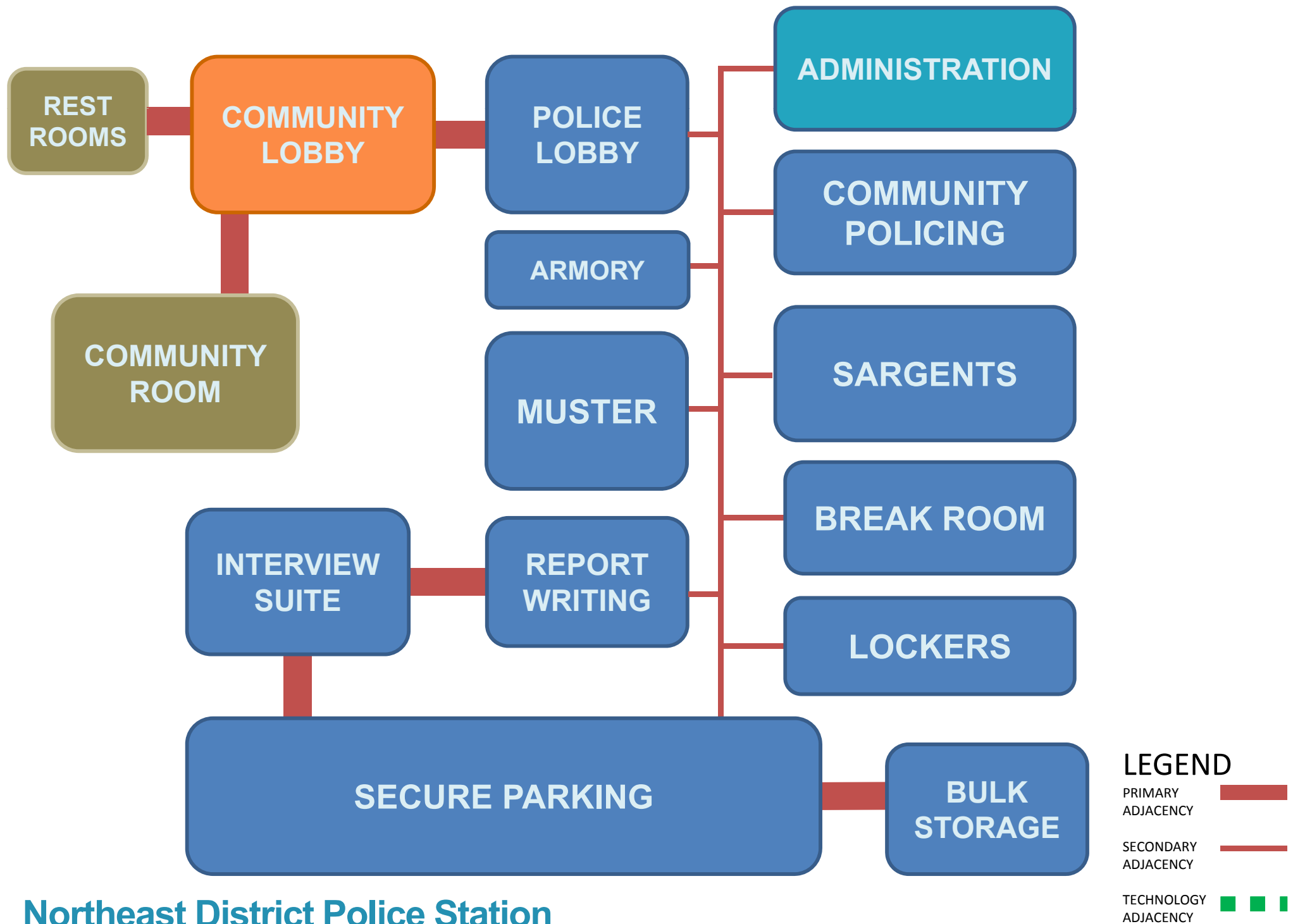
**Northeast District Police Station
Adjacency Diagram**

REST ROOMS

COMMUNITY LOBBY

POLICE LOBBY

ADMINISTRATION

COMMUNITY POLICING

ARMORY

SARGENTS

MUSTER

BREAK ROOM

COMMUNITY ROOM

INTERVIEW SUITE

REPORT WRITING

LOCKERS

SECURE PARKING

BULK STORAGE

LEGEND

PRIMARY ADJACENCY

SECONDARY ADJACENCY

TECHNOLOGY ADJACENCY

LOBBY

FACILITIES OFFICE

RECEVING

SHARED STAFF SUPPORT

CONF

BUILDING SYSTEMS
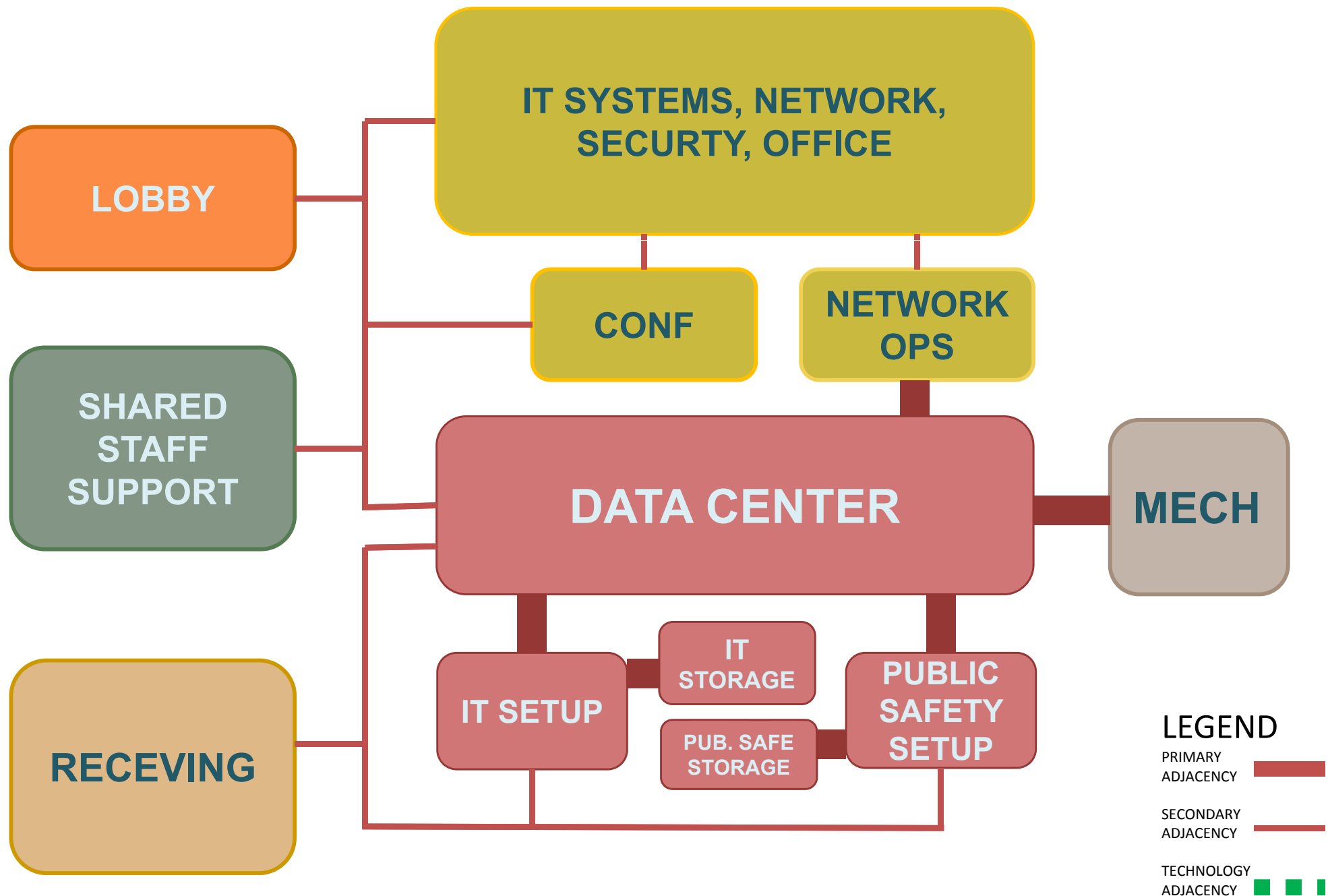
BLDG. SYS. EQUIP. ENCLOSURE
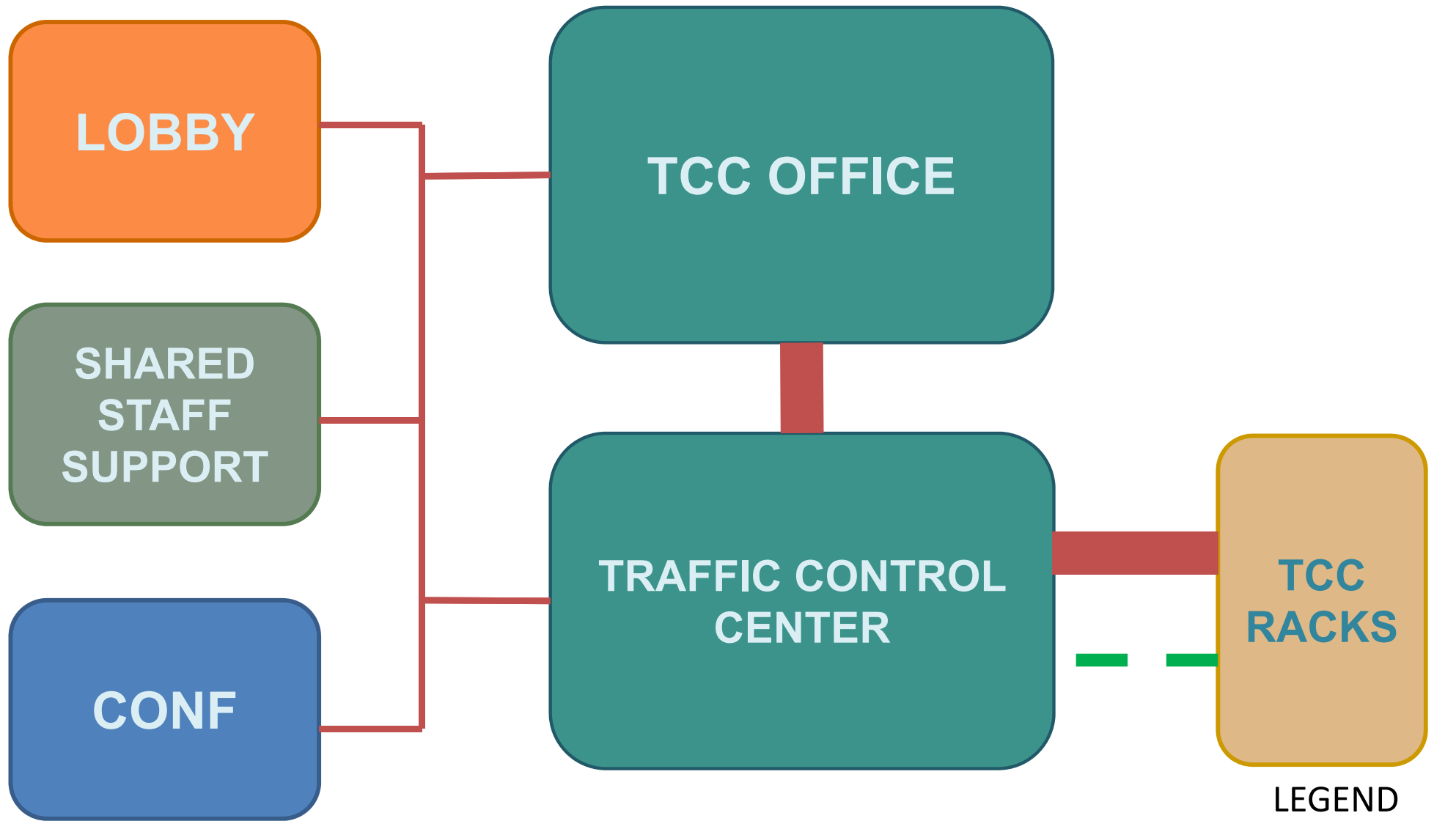
LEGEND

PRIMARY ADJACENCY

SECONDARY ADJACENCY

TECHNOLOGY ADJACENCY

Facilities and Building Systems Adjacency Diagram

Information Technology and Data Center Adjacency Diagram

LOBBY

IT SYSTEMS, NETWORK, SECURTY, OFFICE

CONF

NETWORK OPS

SHARED STAFF SUPPORT

DATA CENTER

MECH

RECEVING

IT SETUP

IT STORAGE

PUB. SAFE STORAGE

PUBLIC SAFETY SETUP

LEGEND

PRIMARY ADJACENCY

SECONDARY ADJACENCY

TECHNOLOGY ADJACENCY

LOBBY

SHARED STAFF SUPPORT

CONF

TCC OFFICE

TRAFFIC CONTROL CENTER

TCC RACKS

Traffic Control Center Adjacency Diagram

LEGEND

PRIMARY ADJACENCY

SECONDARY ADJACENCY

TECHNOLOGY ADJACENCY

Blocking and Stacking

NORTHEAST DISTRICT POLICE STATION

21000 SF

COMMUNITY ROOM

2500 SF
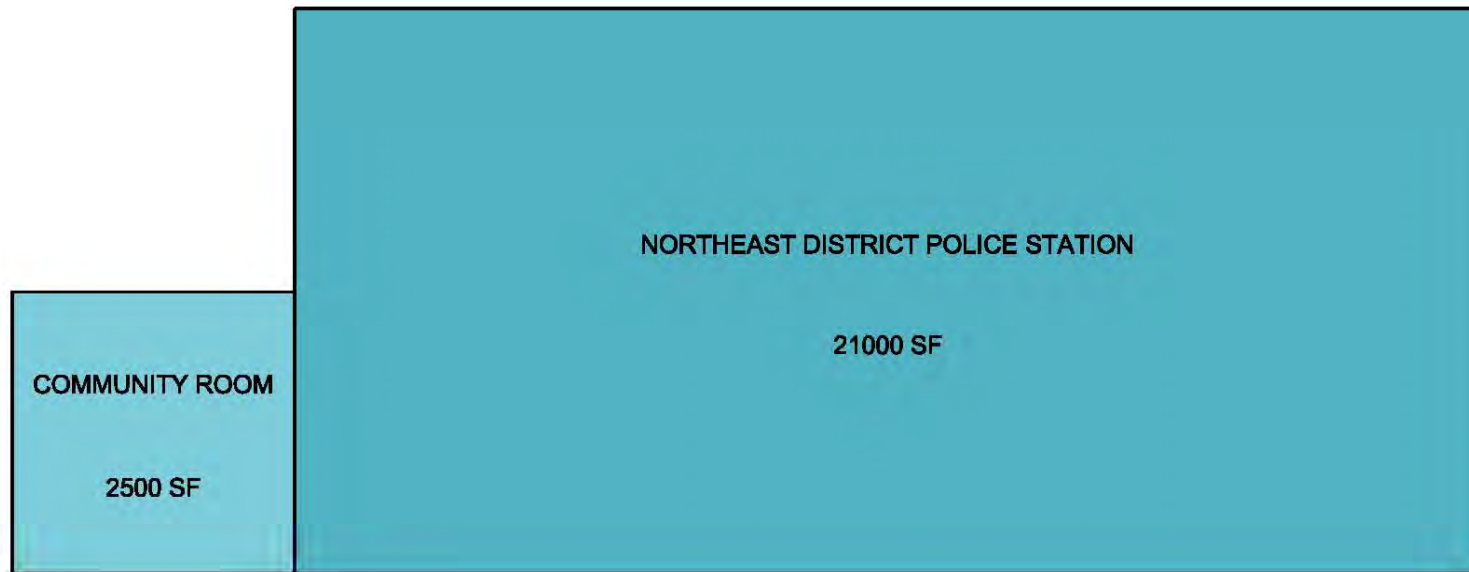
**Option 1 – Northeast District Police Station
Stacking & Blocking Diagram**

STAIR
200 SF

INFORMATION TECHNOLOGY

6700 SF

DATA CENTER

10500 SF

BUILDING SYSTEMS

9000 SF

STAIR
200 SF

LOBBY

2100 SF

VERT CIRCULATION

600 SF

FACILITIES

2100 SF

RECEVING

1800 SF

BUILDING SYSTEMS EQUIPMENT ENCLOSURE

5400 SF
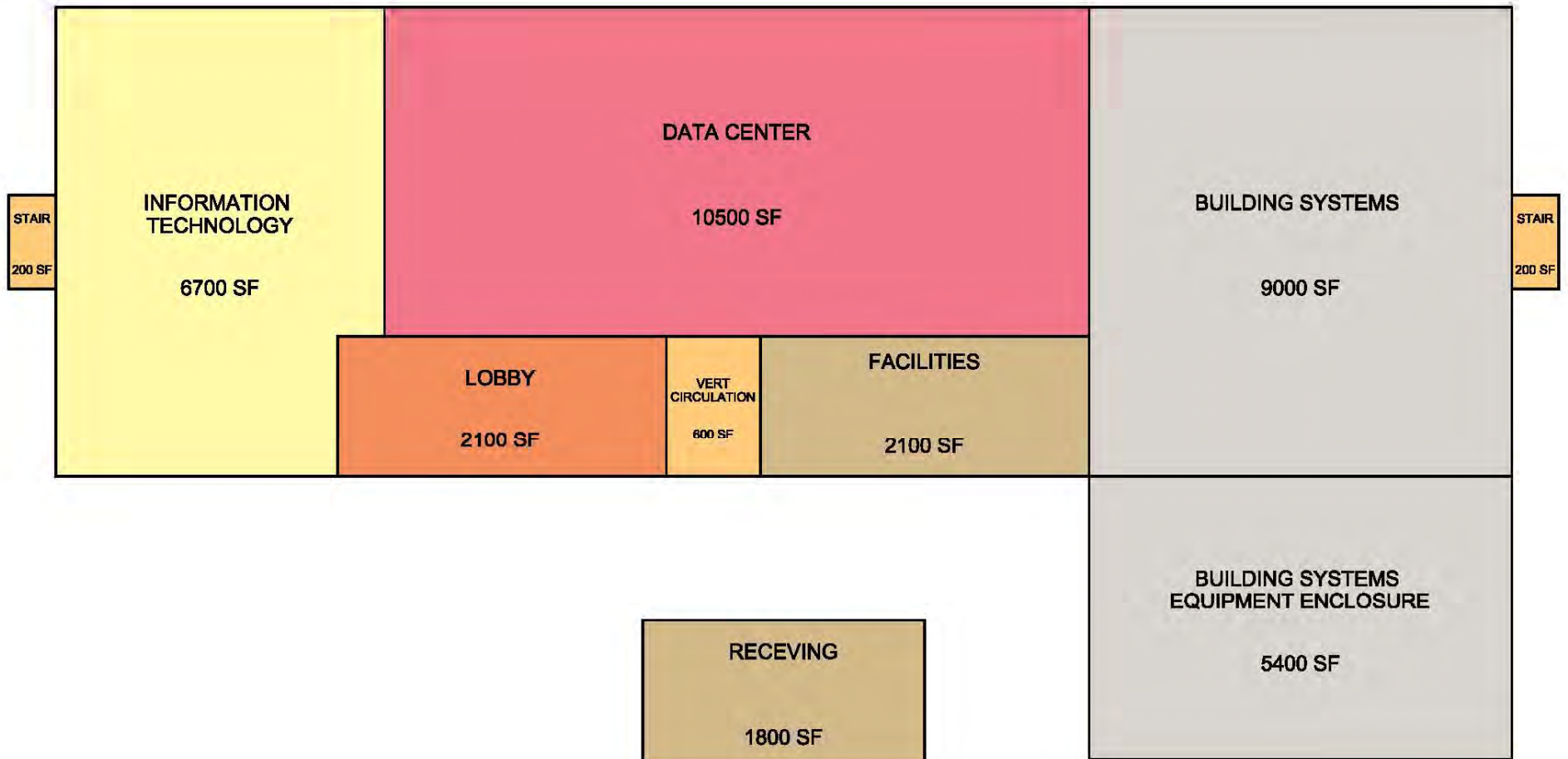
Option 1 – First Floor
Stacking & Blocking Diagram

| STAIR 200 SF | CITY EOC 9100 SF | WAKE COUNTY EOC 8400 SF | SHARED STAFF SUPPORT 4200 SF | STAIR 200 SF |

| TRAFFIC CONTROL CENTER 3600 SF | VERT CIRCULATION 600 SF | ECC CLASSROOM 900 SF | BUILDING SYSTEMS 4200 SF |
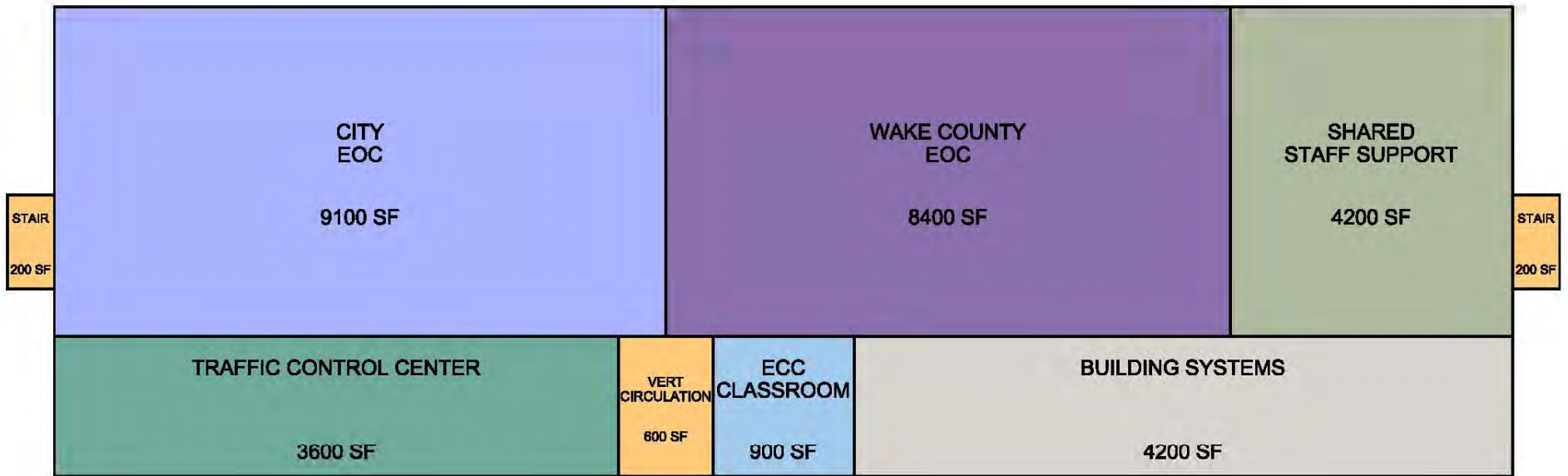
Option 1 – Second Floor
Stacking & Blocking Diagram

STAIR

200 SF

ECC
ADMINISTRATION

8500 SF

ECC
STAFF SUPPORT

4300 SF

BUILDING
SYSTEMS

600 SF

VERT
CIRCULATION

600 SF

ECC
OPERATIONS

17000 SF

STAIR

200 SF
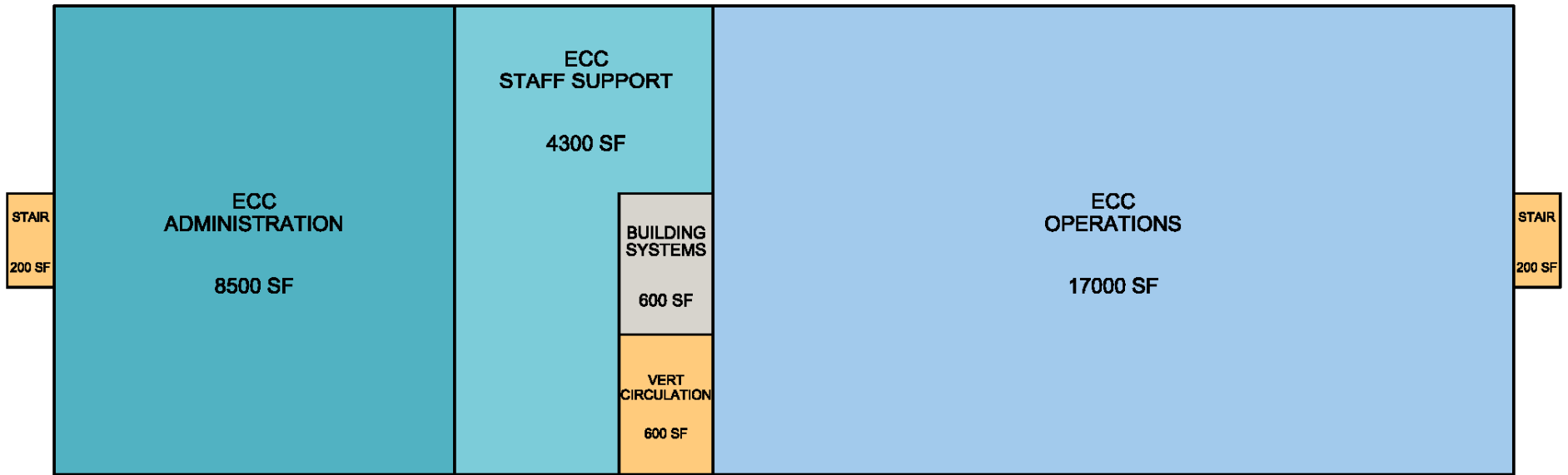
**Option 1 – Third Floor
Stacking & Blocking Diagram**

STAIR
200 SF

INFORMATION
TECHNOLOGY

6700 SF

DATA CENTER

10500 SF

BUILDING SYSTEMS

9000 SF

STAIR
200 SF

LOBBY

2100 SF

VERT
CIRCULATION

600 SF

FACILITIES

2100 SF

BUILDING SYSTEMS
EQUIPMENT ENCLOSURE

5400 SF

RECEVING

1800 SF
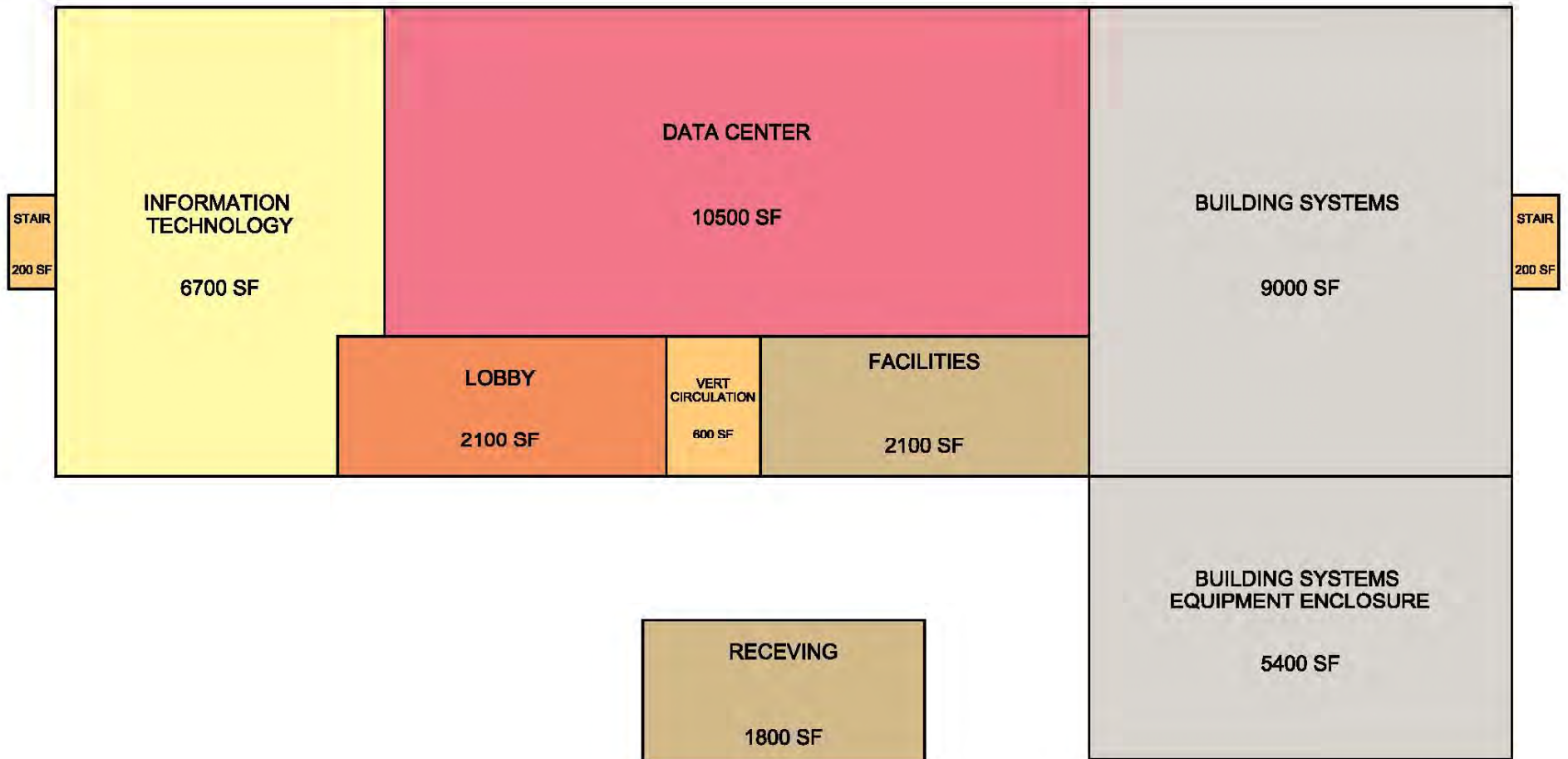
**Option 2 – First Floor
Stacking & Blocking Diagram**

STAIR
200 SF

ECC
ADMINISTRATION

8500 SF

ECC
STAFF SUPPORT

4300 SF

BUILDING
SYSTEMS

600 SF

VERT
CIRCULATION

600 SF

ECC
OPERATIONS

17000 SF

STAIR
200 SF
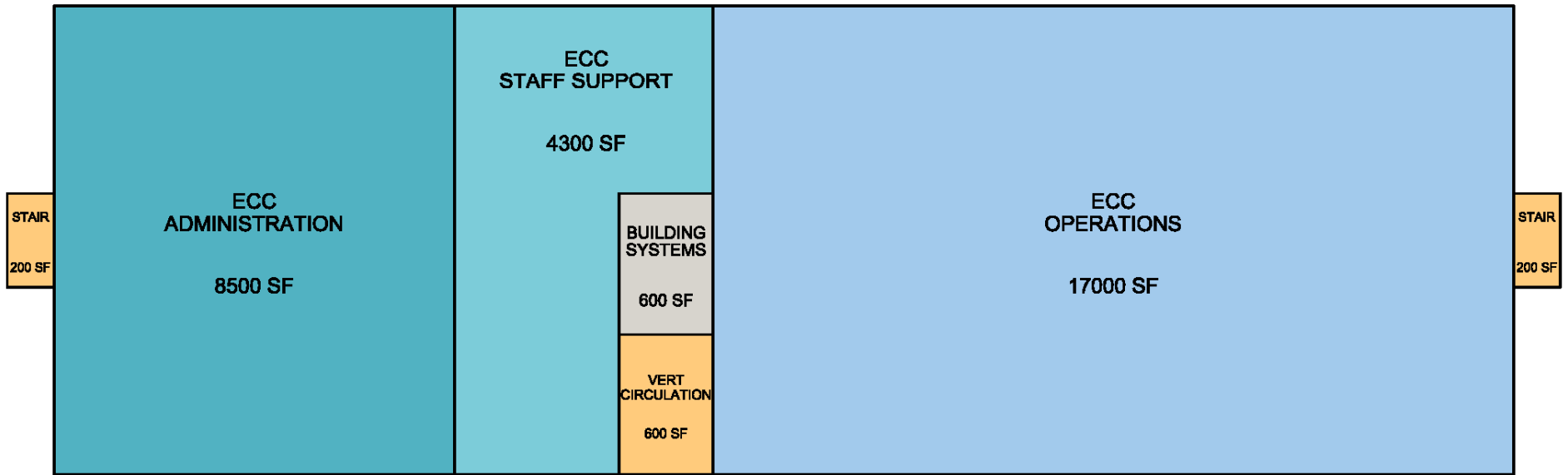
**Option 2 – Second Floor
Stacking & Blocking Diagram**

STAIR

200 SF

CITY EOC

9100 SF

SHARED STAFF SUPPORT

4200 SF

TRAFFIC CONTROL CENTER

3600 SF

VERT CIRCULATION

600 SF

ECC CLASSROOM

900 SF

BUILDING SYSTEMS

3600 SF
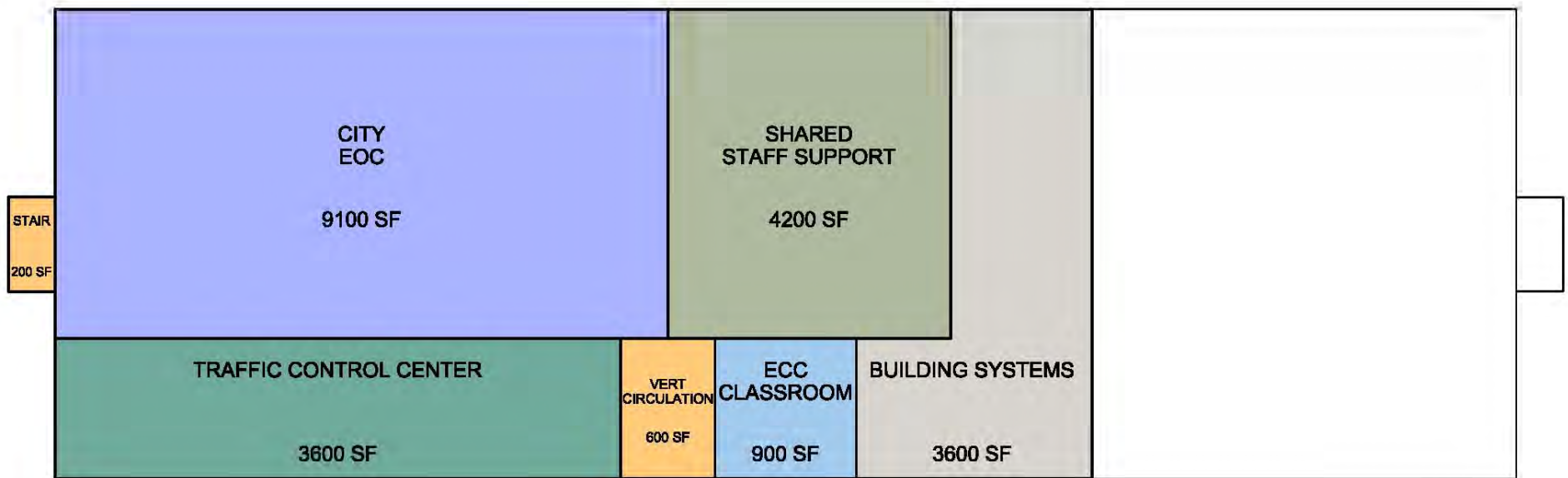
Option 2 – Third Floor
Stacking & Blocking Diagram

BUILDING SYSTEMS

11550 SF

FACILITIES

1950 SF

STAIR

200 SF

VERT
CIRCULATION

600 SF
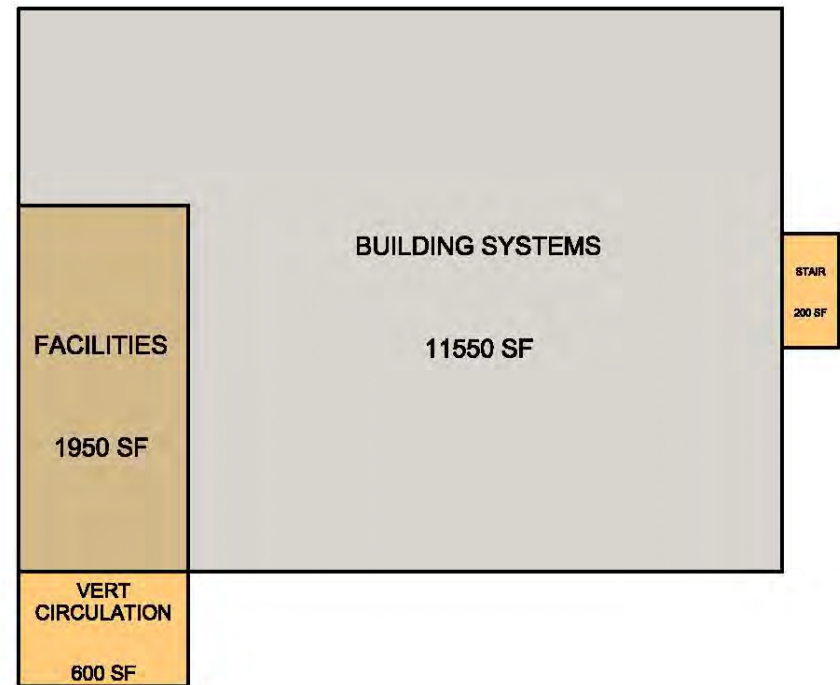
**Option 3 – Lower Level
Stacking & Blocking Diagram**

STAIR
200 SF

CITY EOC

10500 SF

DATA CENTER

10500 SF

INFORMATION TECHNOLOGY

7500 SF

STAIR
200 SF

LOBBY

1925 SF

SHARED STAFF SUPPORT

3850 SF

TRAFFIC
CONTROL CENTER

3525 SF

VERT
CIRCULATION

600 SF

BUILDING SYSTEMS
EQUIPMENT ENCLOSURE

5775 SF

RECEVING

1800 SF
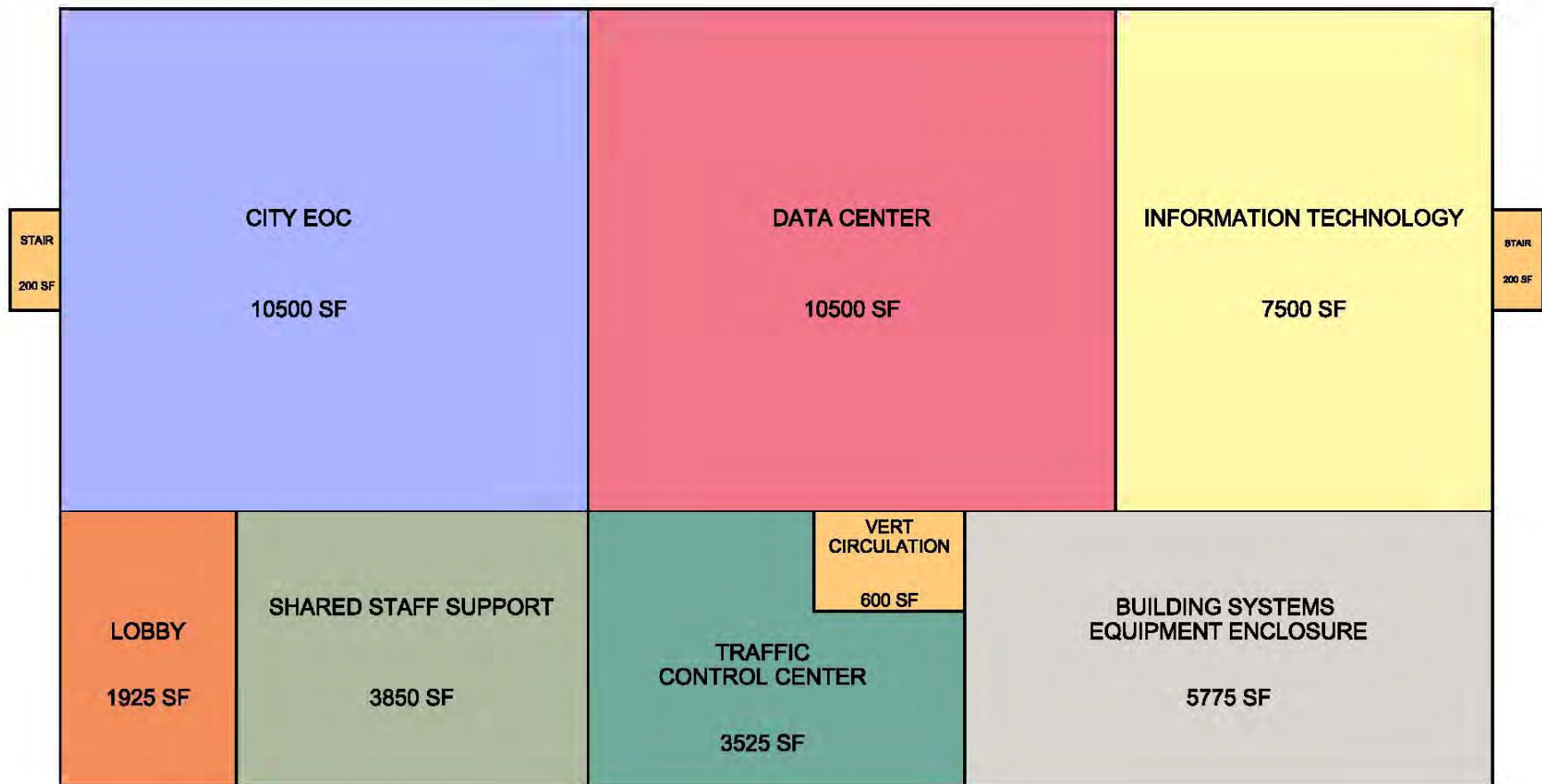
**Option 3 – First Floor
Stacking & Blocking Diagram**

ECC
STAFF SUPPORT

3300 SF

ECC
OPERATIONS

18000 SF

STAIR

200 SF

STAIR

200 SF

ECC
ADMINISTRATION

7700 SF
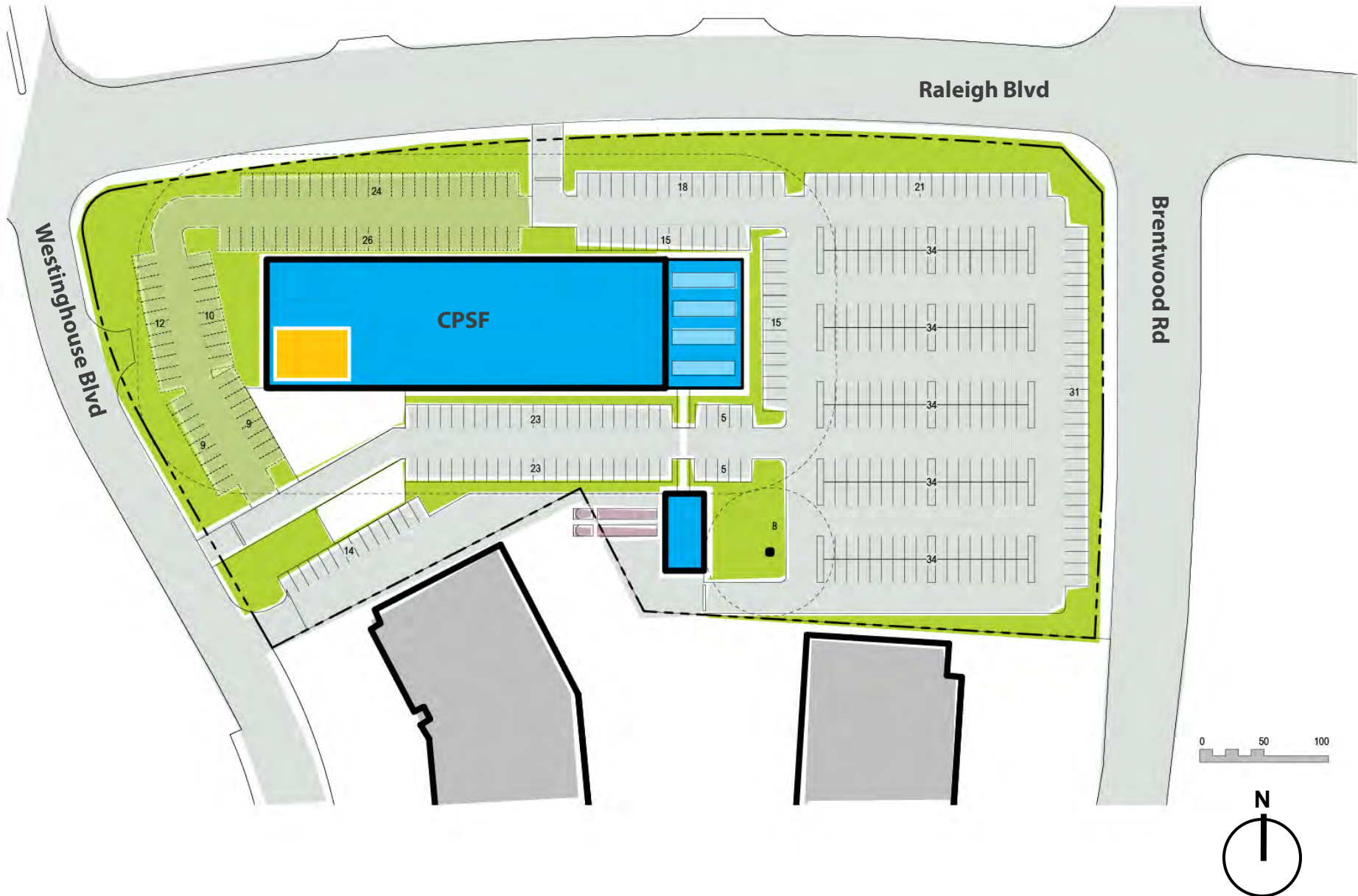
VERT
CIRCULATION

600 SF

BUILDING
SYSTEMS

600 SF
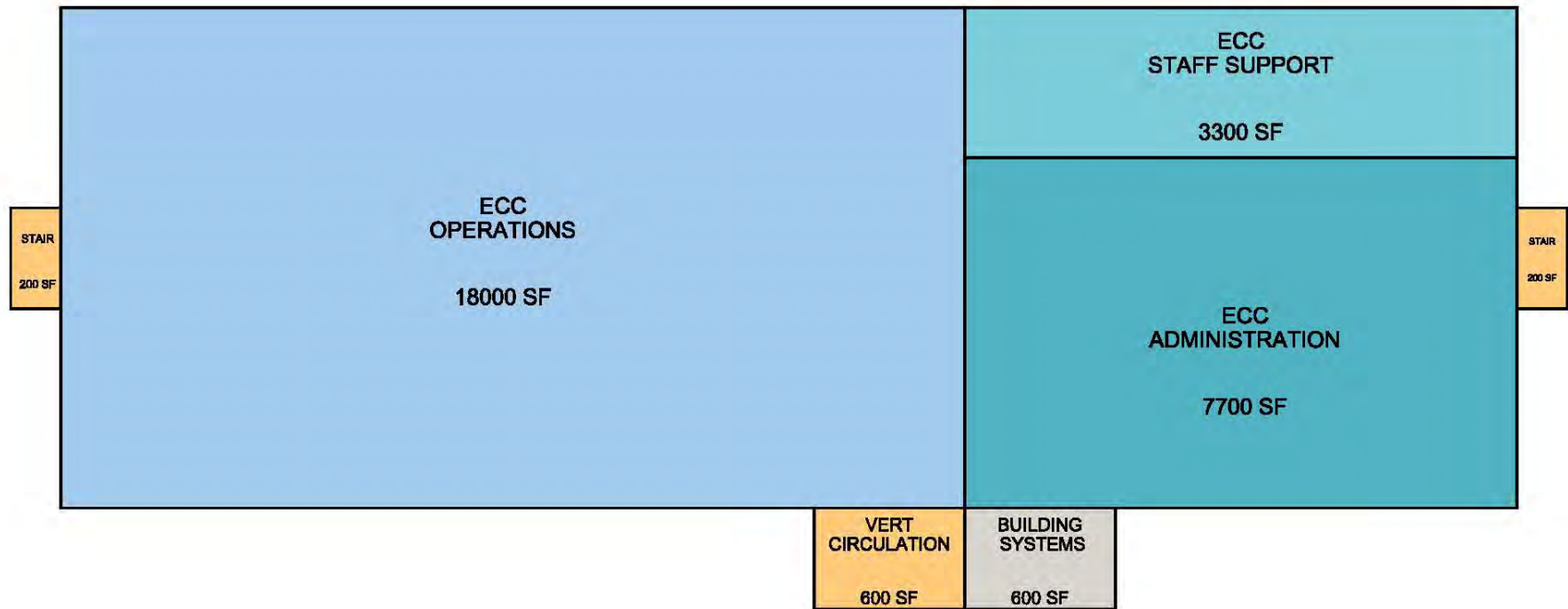
**Option 3 – Third Floor
Stacking & Blocking Diagram**

Site Layout Options

(2) CPSF
(2) CPSF + NE Dist Police

Option A – CPSF only

Raleigh Blvd

Westinghouse Blvd

Brentwood Rd

CPSF

24

26

18

21

15

34

12

10

15

34

9

23

5

31

34

9

23

5

34

14

8

34

0 50 100

N

Option A – security setback
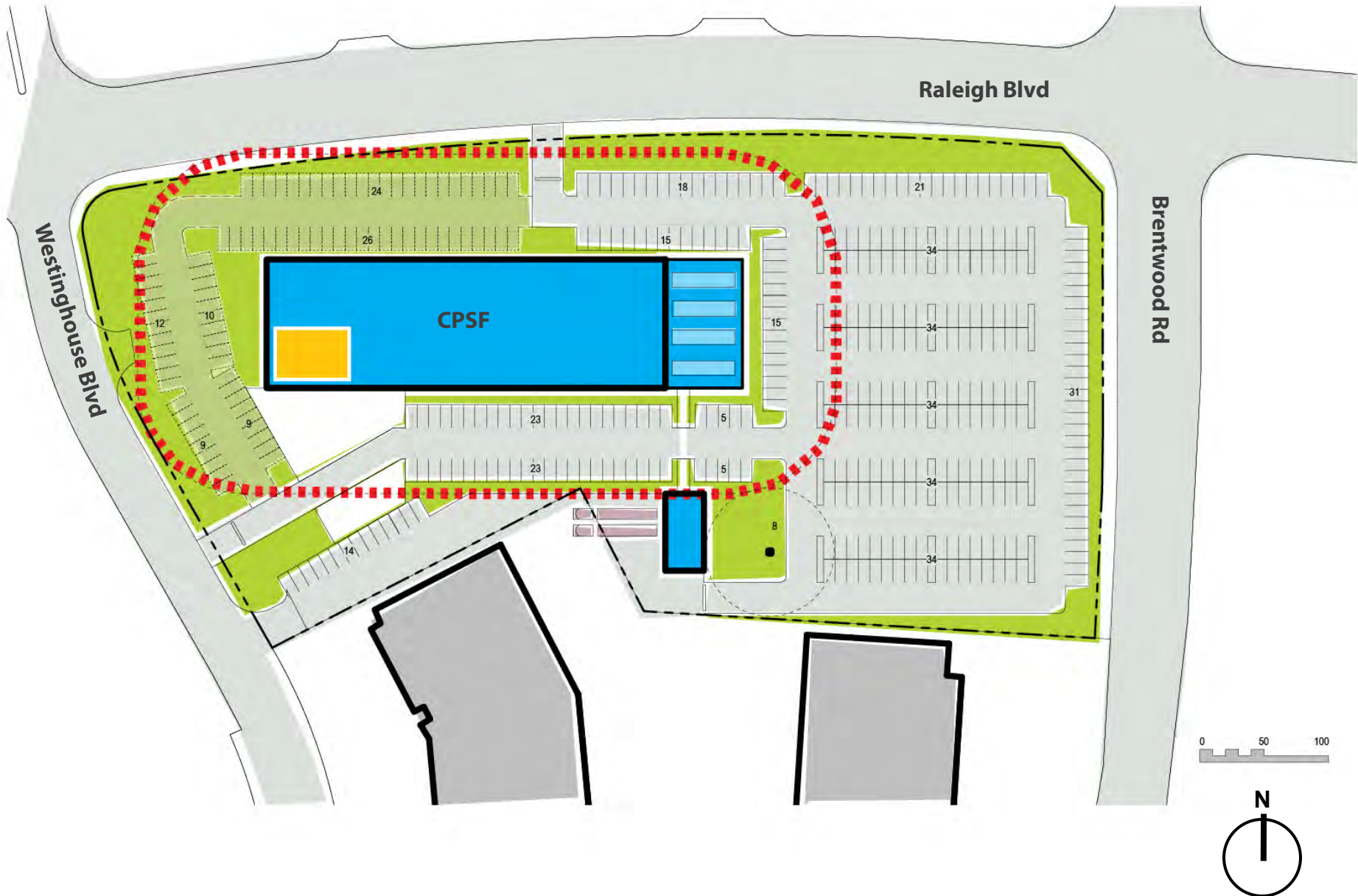
Option A – vehicular access

Raleigh Blvd

Westinghouse Blvd

Brentwood Rd

CPSF

24

26

18

21

15

34

12

10

15

34

9

23

5

31

9

23

5

34

14

8

34

34

0   50   100

N
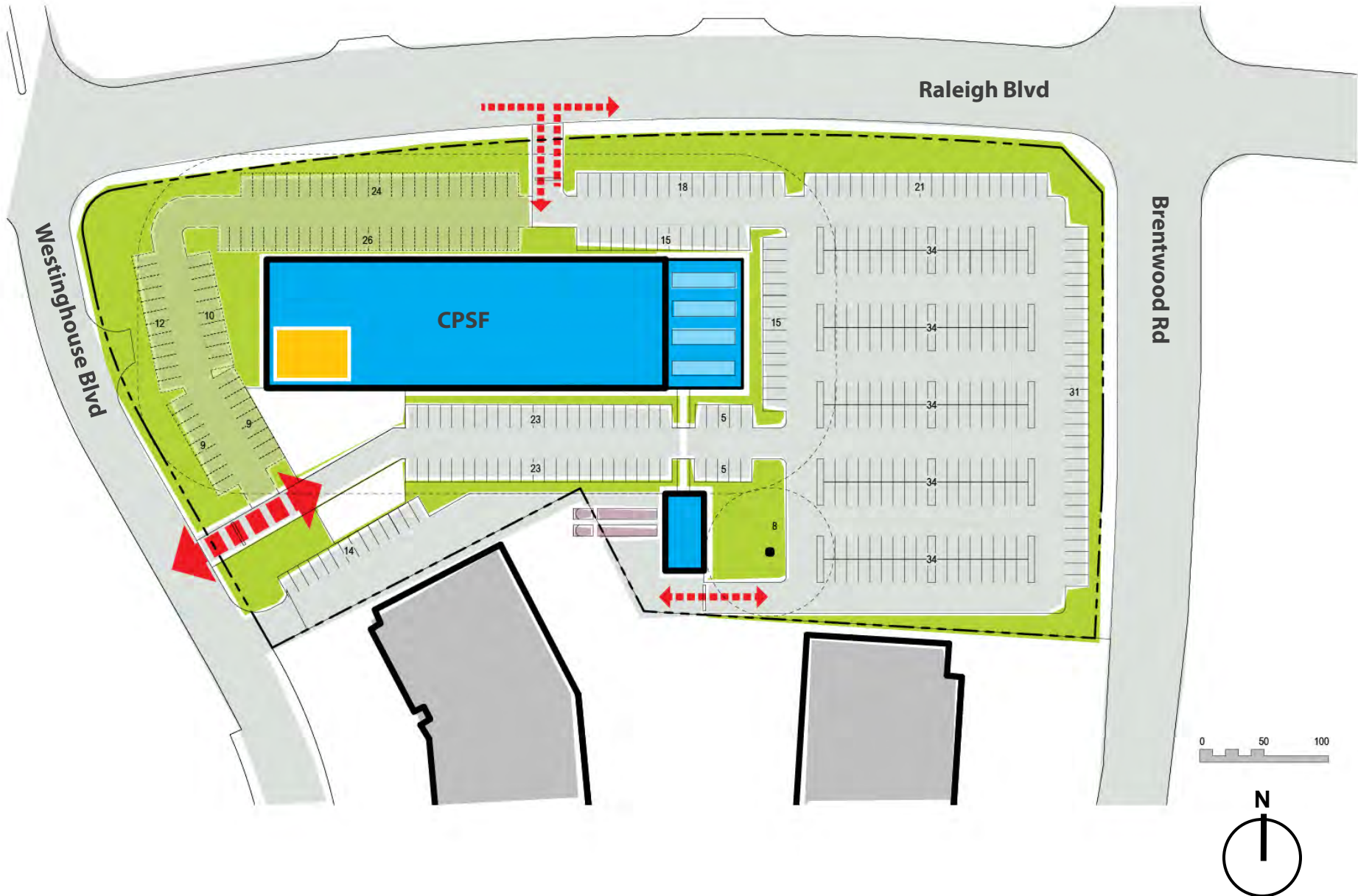
Option A – approx. parking (430)

Raleigh Blvd

Westinghouse Blvd

Brentwood Rd

90

340

CPSF

24
26
12
10
9
9
14
18
15
15
23
23
5
5
21
34
34
31
34
34
8

0 50 100

N

Option B – CPSF only

Raleigh Blvd

Westinghouse Blvd

Brentwood Rd

CPSF

34

31

31

22

16

22

7

9

24

2

19

7

22

22

6

22

11

11

7

11

11

30

30

11

0   50   100

N
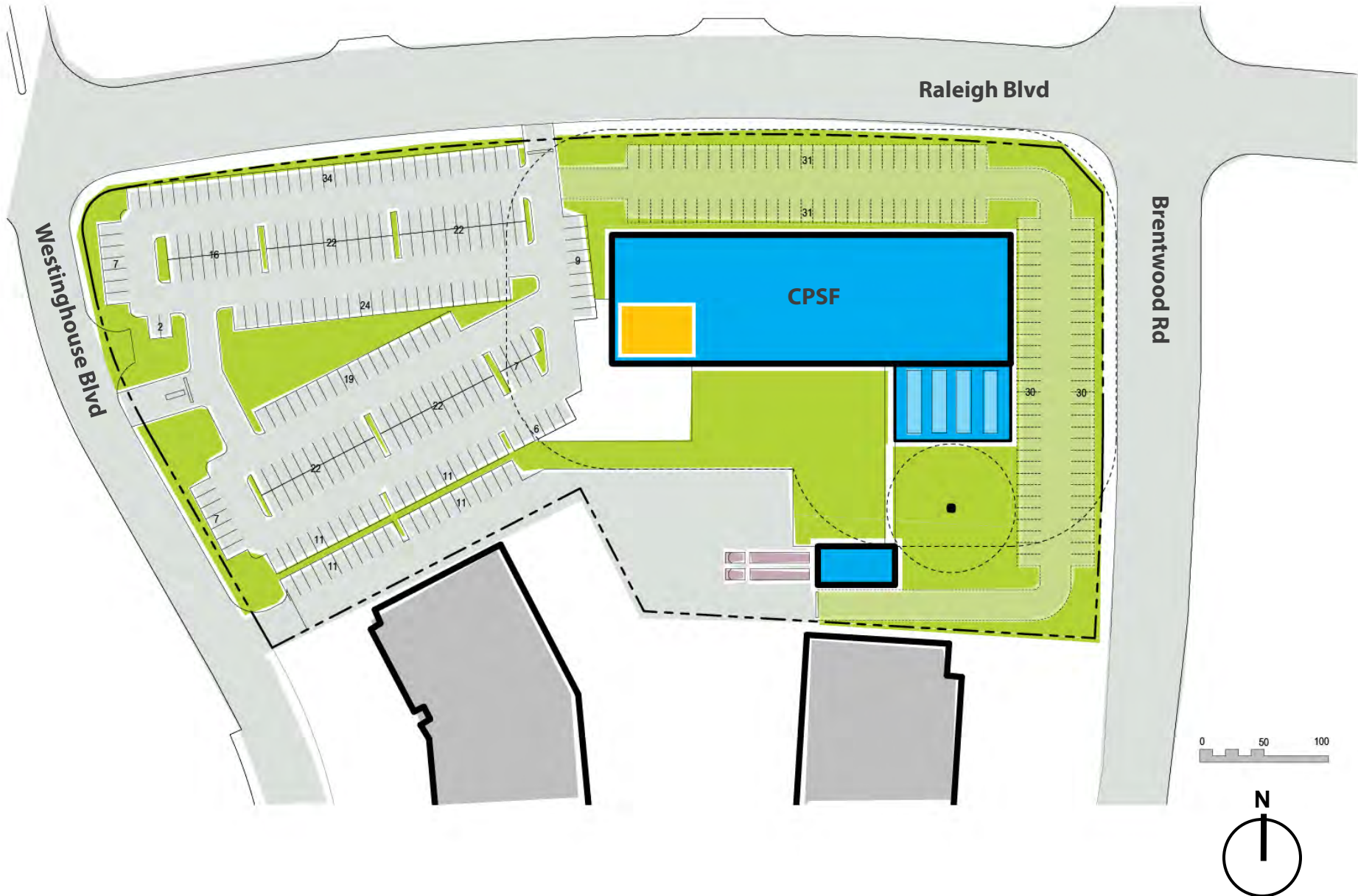
Option B – security setback

Raleigh Blvd

Westinghouse Blvd

Brentwood Rd

CPSF

N

0   50   100
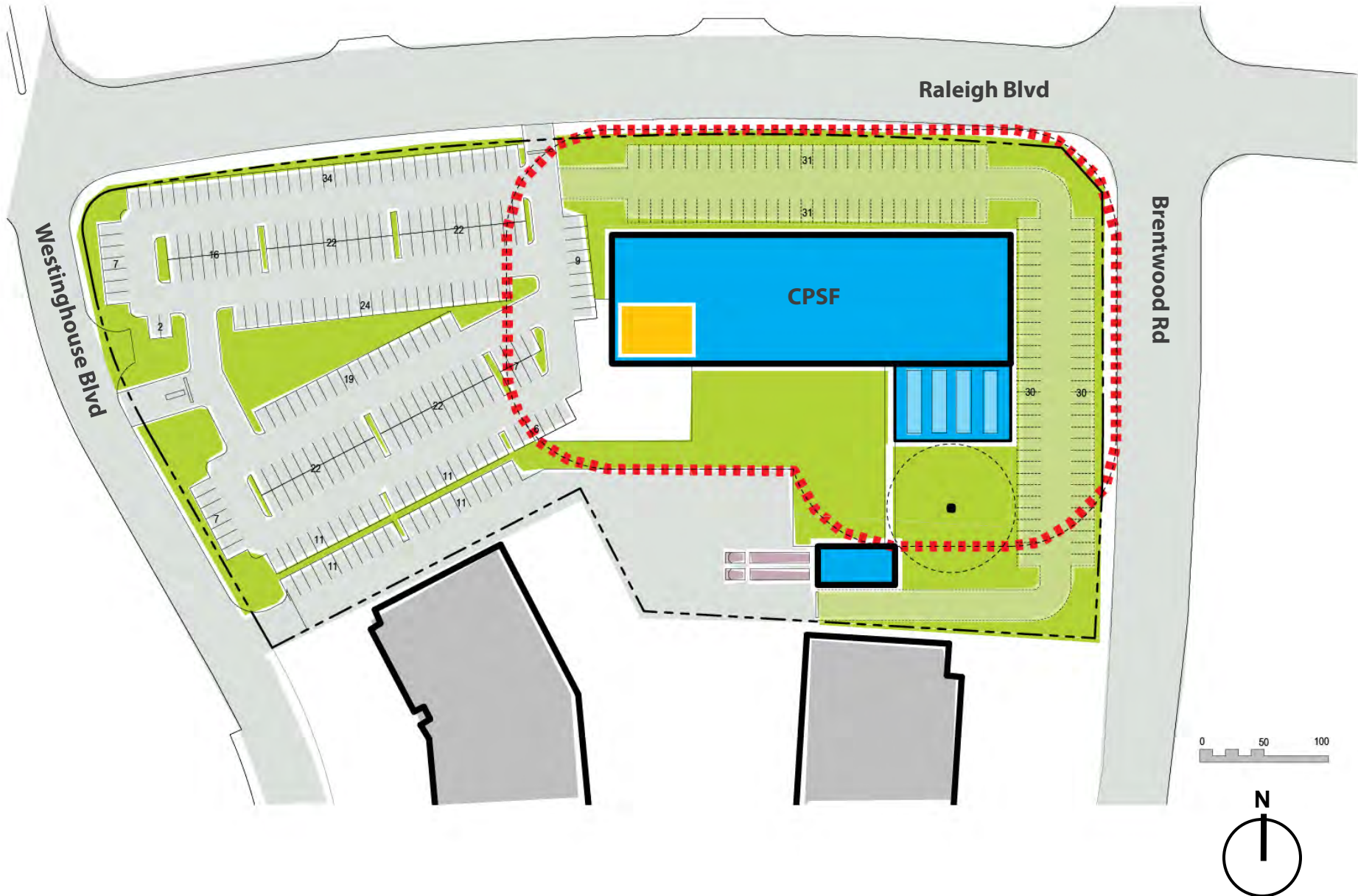
Option B – vehicular access

Raleigh Blvd

Westinghouse Blvd

Brentwood Rd

CPSF

N
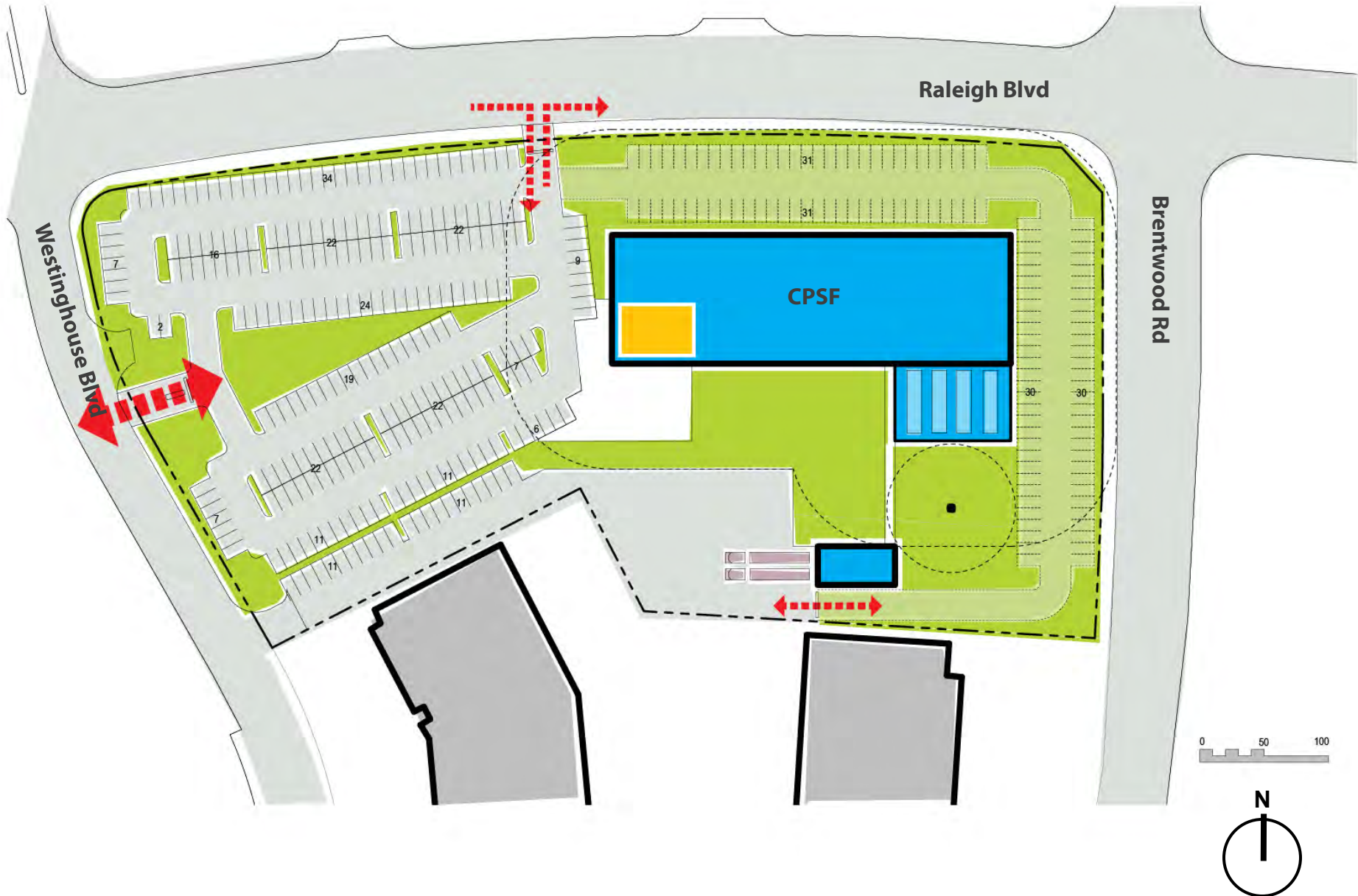
Option B – approx. parking (385)

Raleigh Blvd

Westinghouse Blvd

Brentwood Rd

122

263

CPSF

34

31

31

16

22

22

9

7

24

2

19

7

22

6

22

11

11

7

11

11

30

30

0   50   100

N
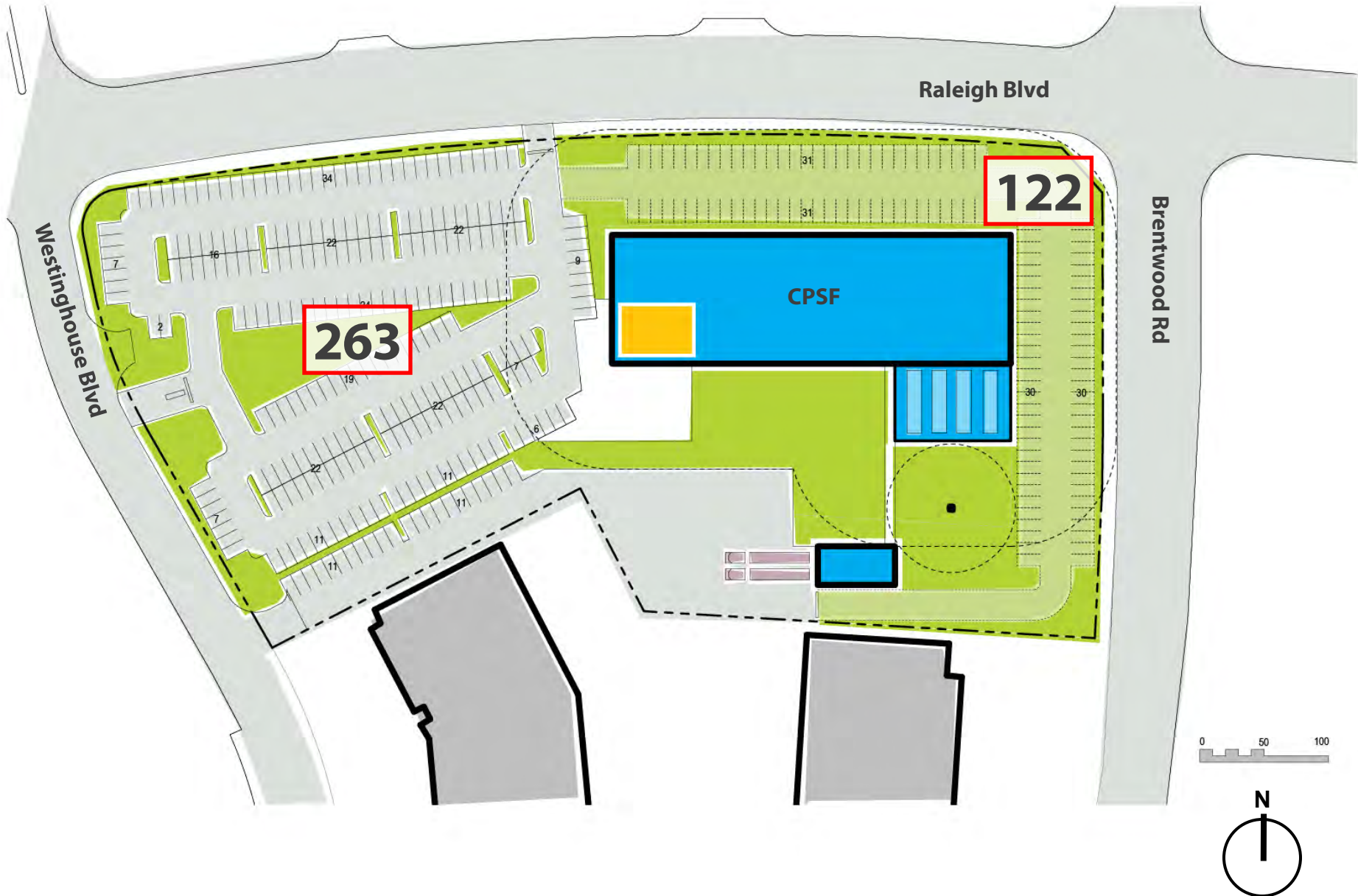
Option C – CPSF and NE District Police

Raleigh Blvd

Westinghouse Blvd

Brentwood Rd

NEDP

CPSF

Deck

33
33
20
19
21
17
18
18
13
22

0   50   100

N
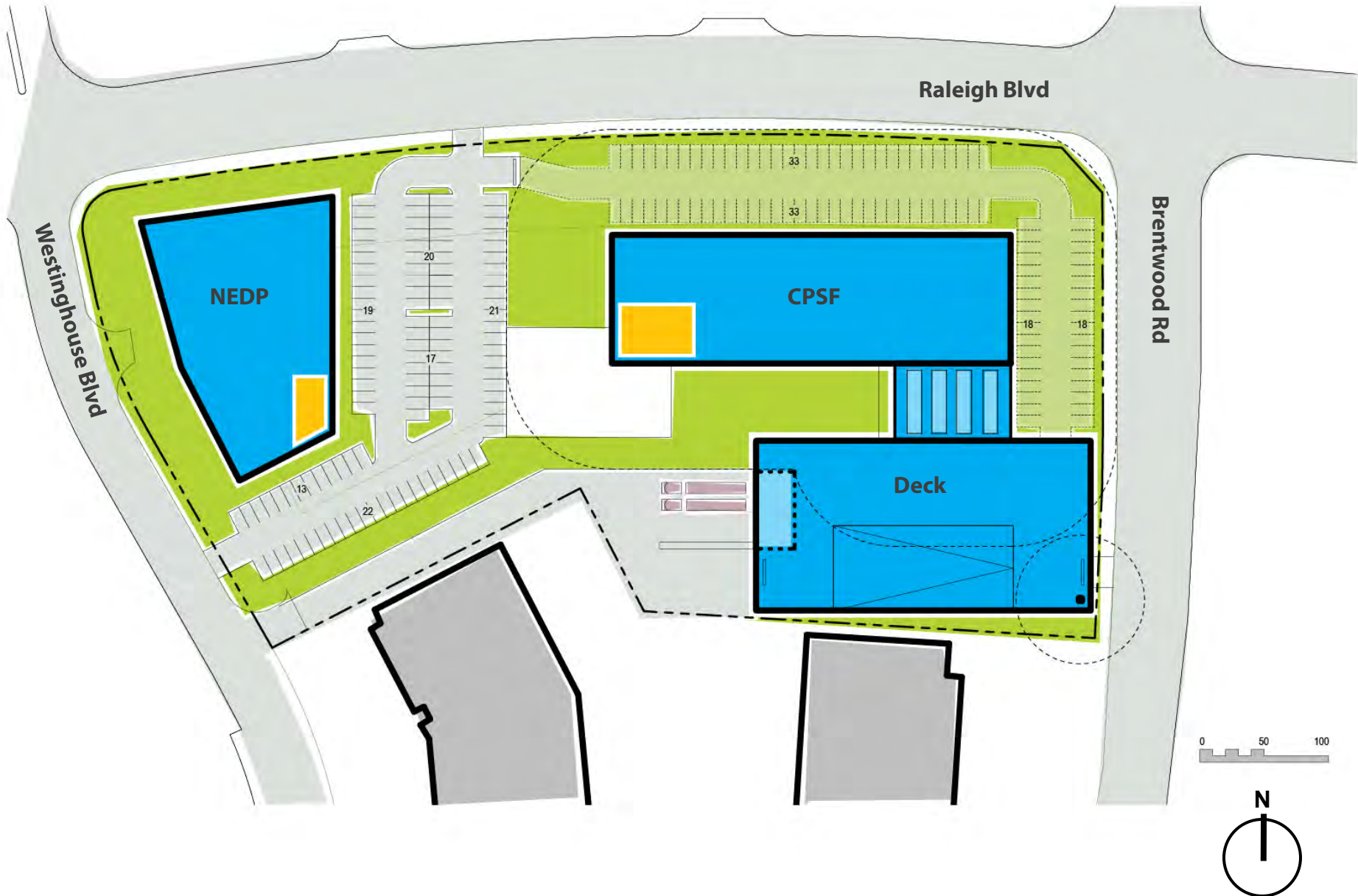
Option C – security setback

Raleigh Blvd

Westinghouse Blvd

Brentwood Rd

NEDP

CPSF

Deck

33

33

20

19

21

17

18

18

13

22

N

0   50   100
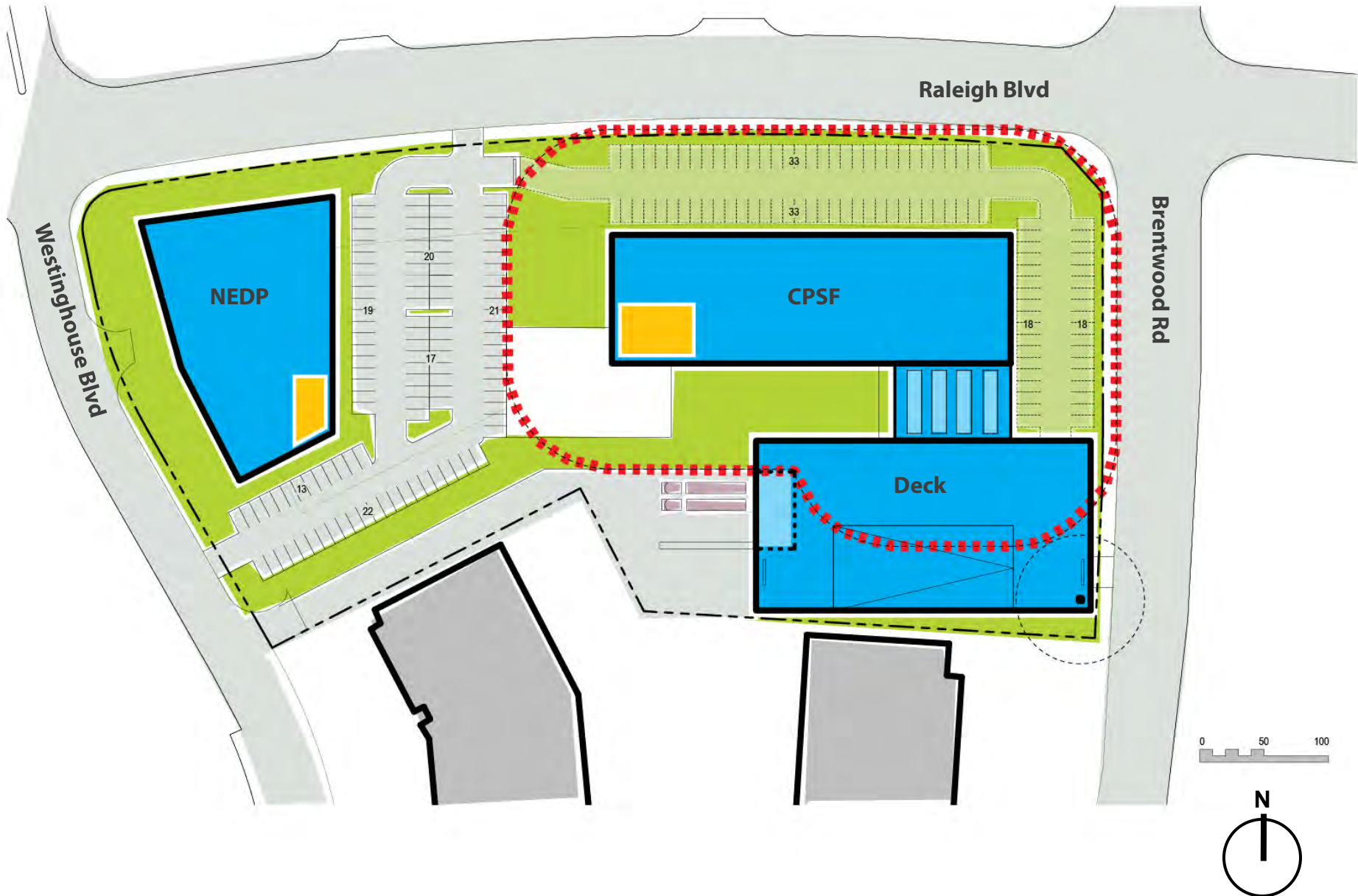
Option C – vehicular access

Raleigh Blvd

Westinghouse Blvd

Brentwood Rd

NEDP

CPSF

Deck

33

33

20

19

21

17

18

18

13

22

N

0   50   100
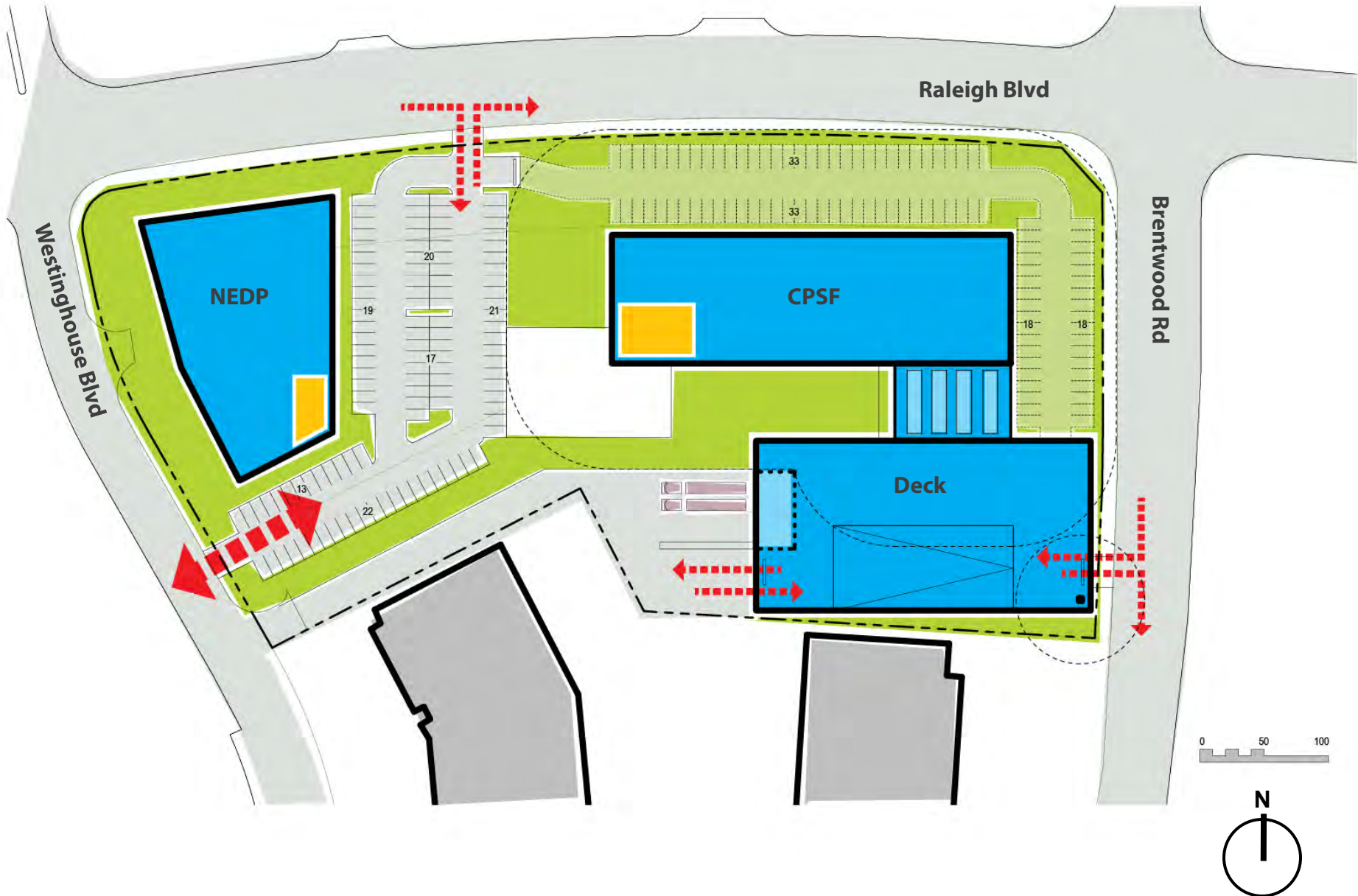
Option C – approx. parking (564)

Raleigh Blvd

Westinghouse Blvd

Brentwood Rd

NEDP

CPSF

Deck

112

102

350

33

33

20

19

21

18

18

17

13

22

N

0   50   100
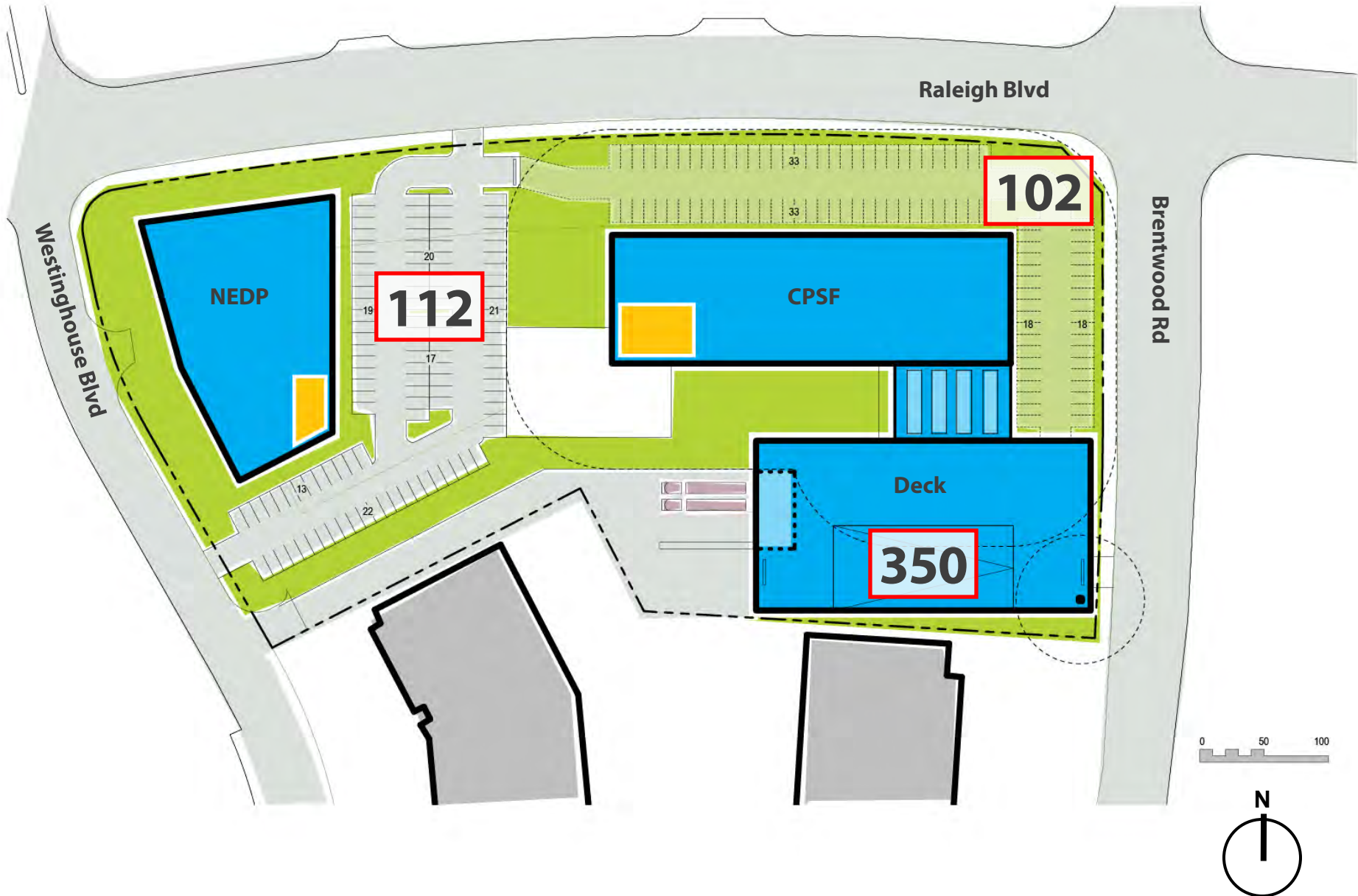
Option D – CPSF and NE District Police

NEDP

Deck

CPSF

Raleigh Blvd

Westinghouse Blvd

Brentwood Rd

31

31

24

24

30   30

0   50   100

N
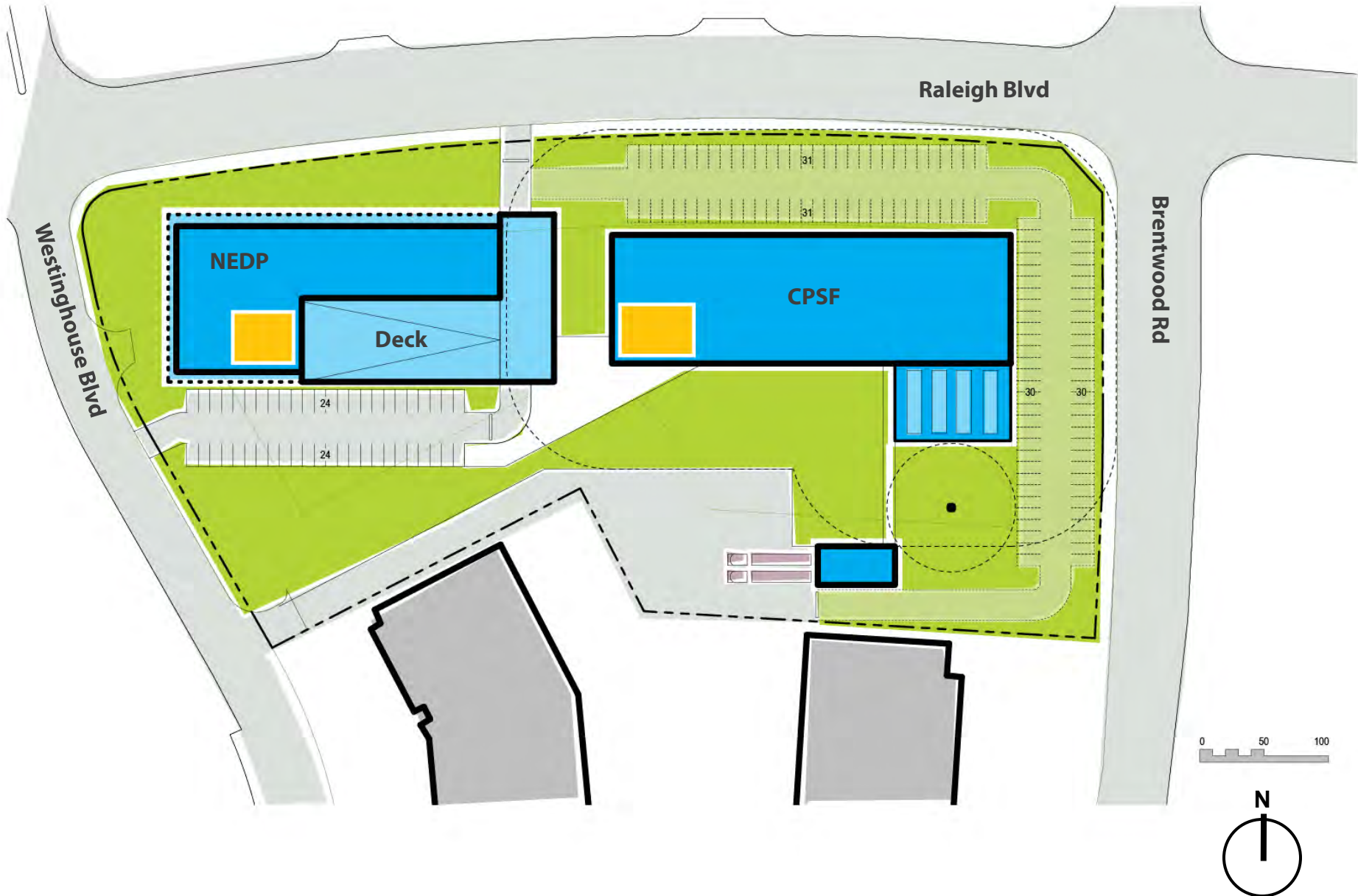
Option D – security setback

Raleigh Blvd

Westinghouse Blvd

Brentwood Rd

NEDP

Deck

CPSF

31

31

24

24

30 30

0 50 100

N
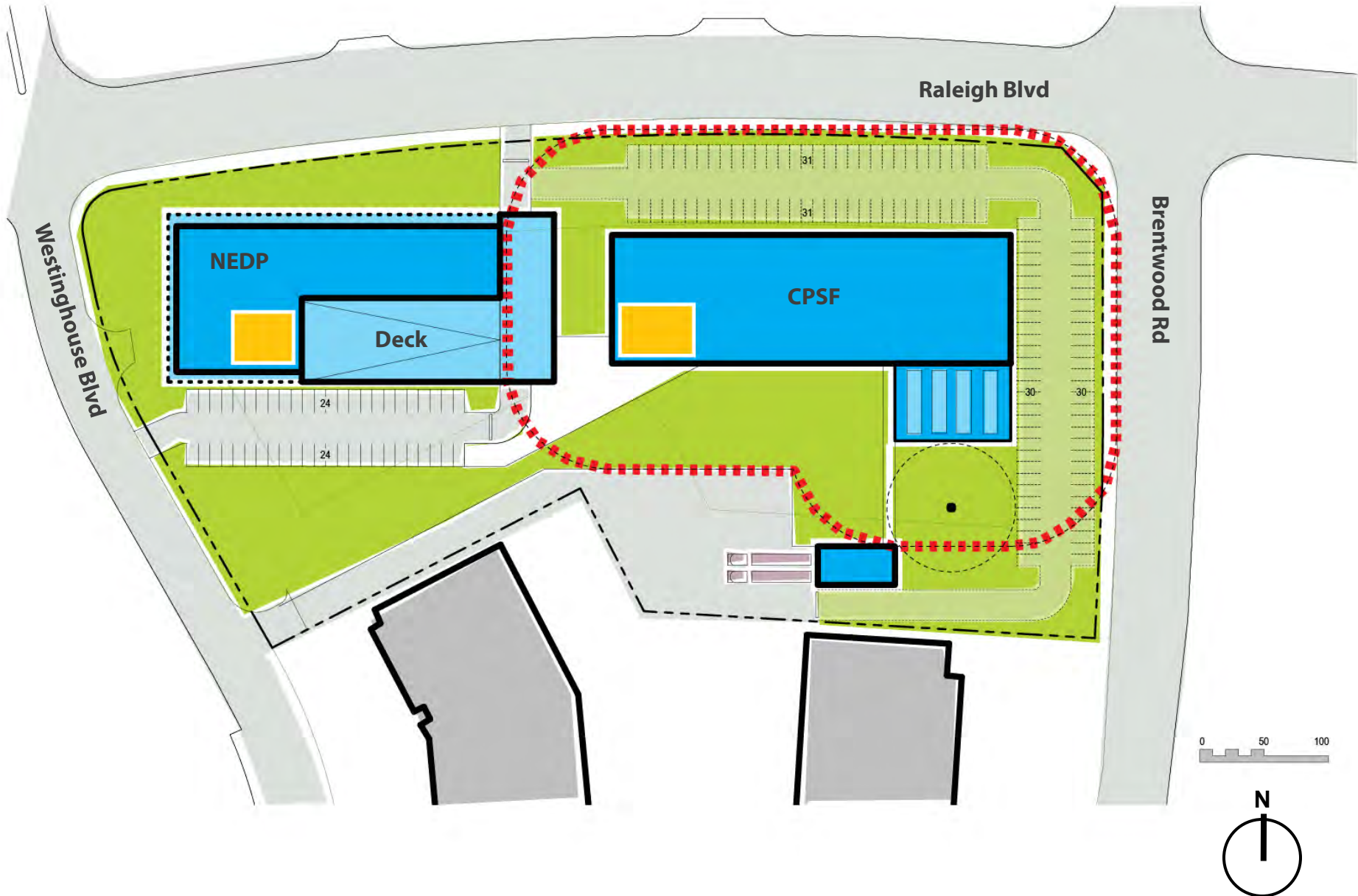
Option D – vehicular access

Raleigh Blvd

Brentwood Rd

Westinghouse Blvd

NEDP

Deck

CPSF

31

31

24

24

30   30

0   50   100

N
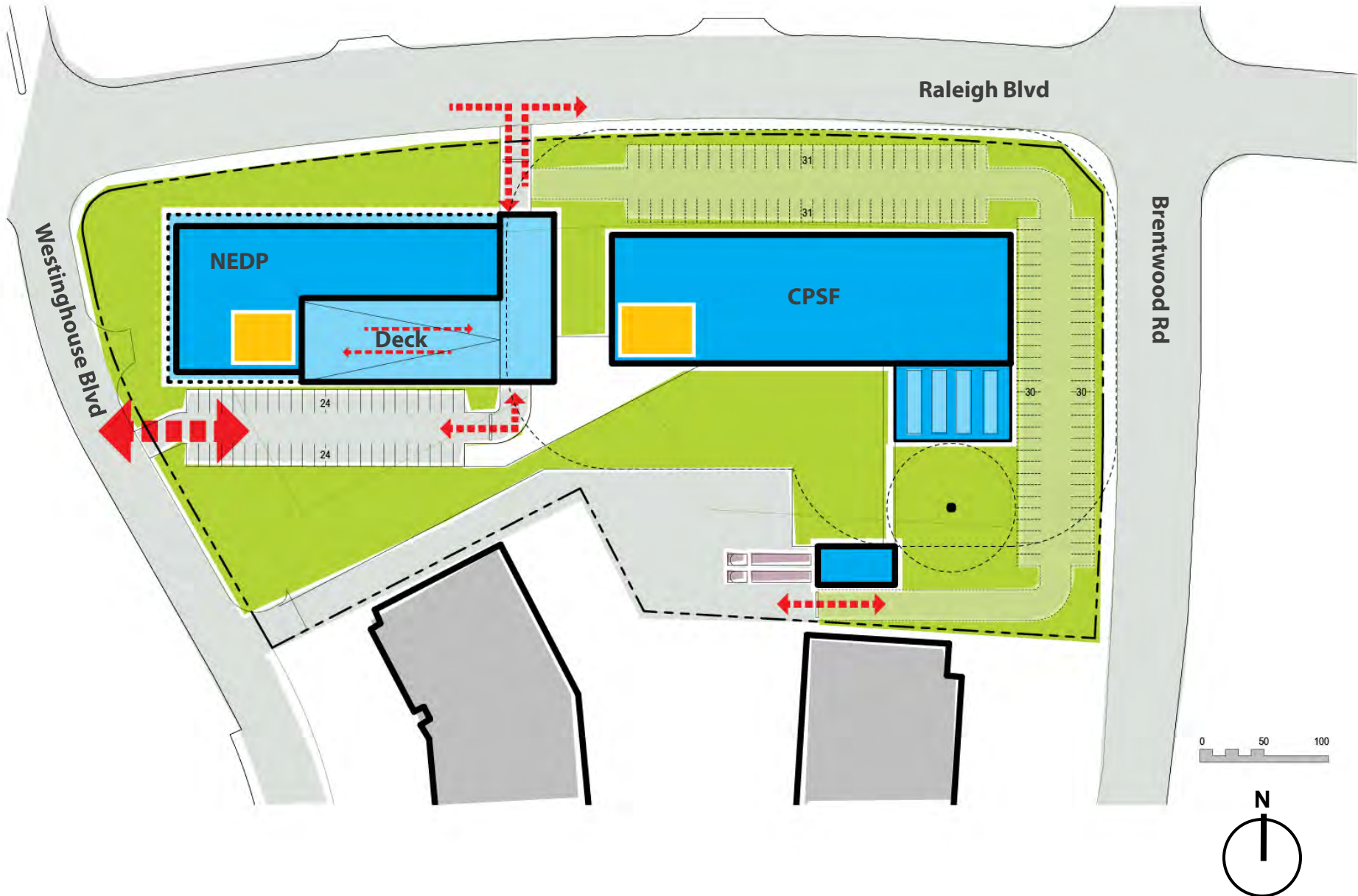
Option D – approx. parking (570)

Raleigh Blvd

Westinghouse Blvd

Brentwood Rd

NEDP

CPSF

Deck

400

122

48

31

31

24

30   30

N

0   50   100
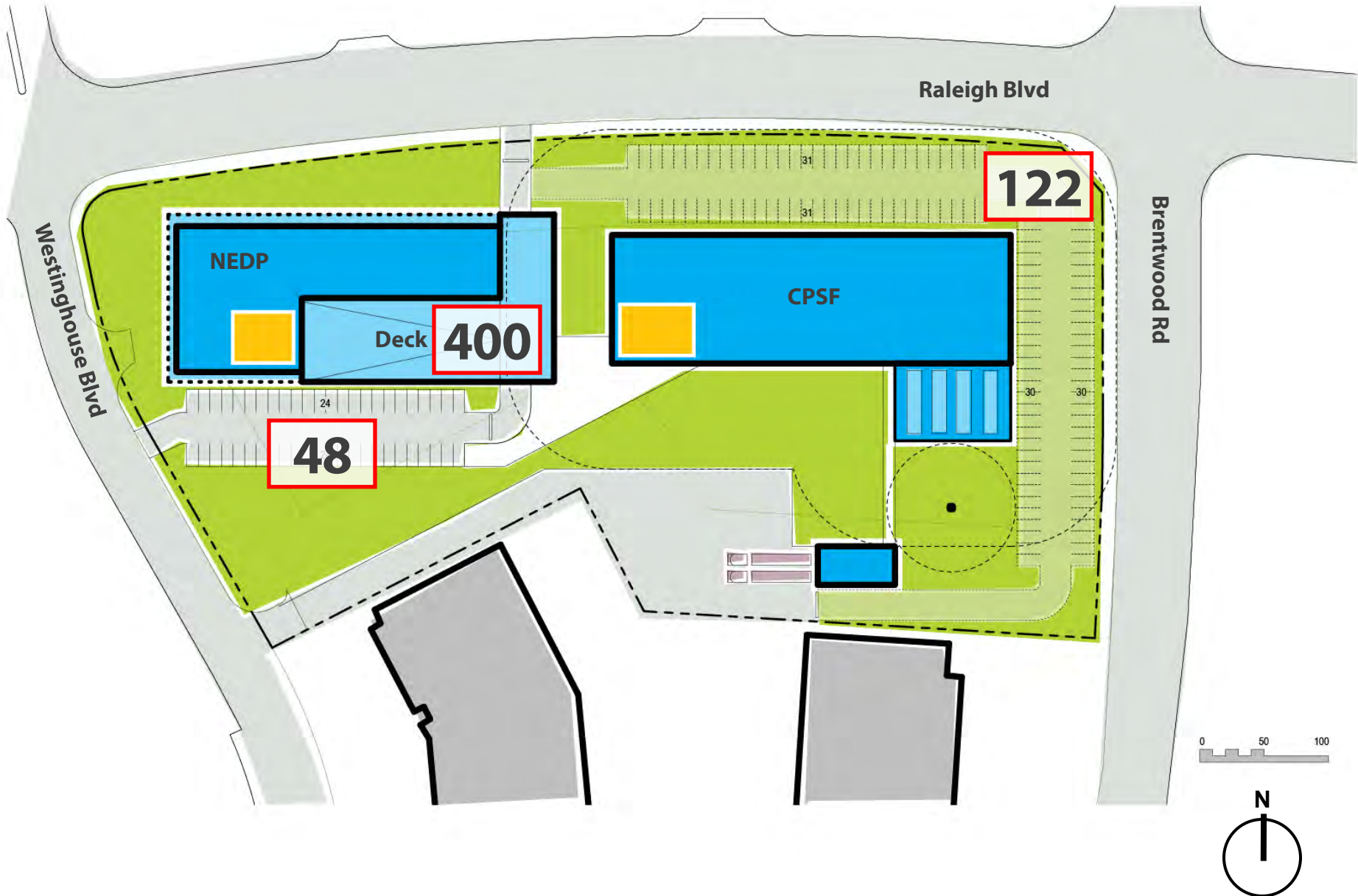
Building Systems / Technology

HVAC ▪ Plumbing ▪ Fire Protection

Mechanical

1 October 2012

City of Raleigh

Pearce Brinkley Cease + Lee | AECOM

Key Design Objectives

- **Design within limits of critical equipment thermal and moisture requirements.**

- **Provide a comfortable thermal environment.**

- **Provide critical system redundancy for uninterruptable operation.**

- **Optimize energy performance with proven & highly reliable energy saving technologies.**

- **Provide HVAC system flexibility.**

- **Control outside air intakes and limit penetrations.**

Central Plant Systems

- **Chilled Water**
  - High Efficiency Variable Speed Chillers
  - Variable-Primary Pumping System
  - Water-Side Economizer

- **Heating Hot Water**
  - High Efficiency Condensing Boilers
  - Primary / Secondary Pumping System
  - High Δ T (50 $^{\circ}$F)

Data Center

- **Computer Room Units**
  - Chilled Water
  - Energy Efficient Plug Fans
  - Raised Floor Air Distribution
  - Cold Aisle / Hot Aisle Approach

- **Rack Hot Spots**
  - Caused by High Powered Equipment
    - Up to 35 kW per Rack
  - Water-Cooled System Racks
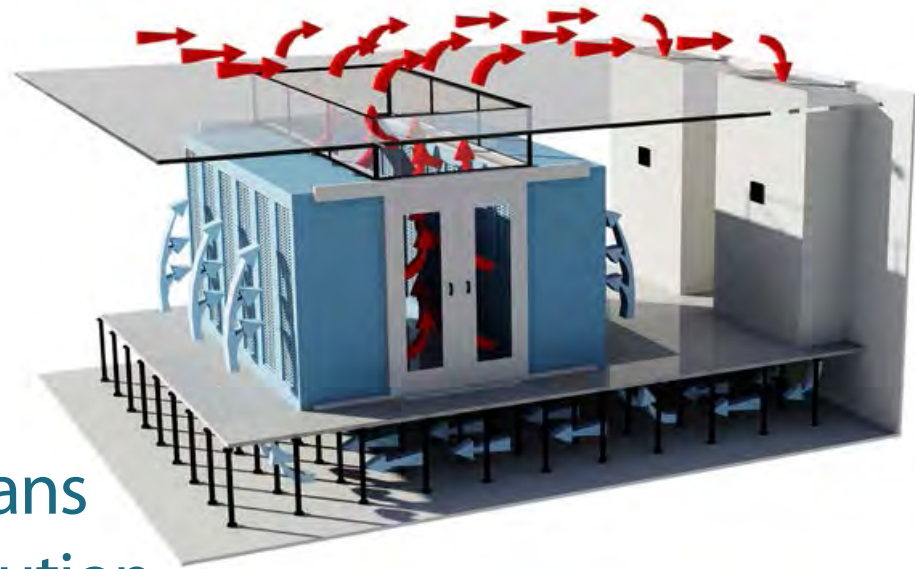
HVAC Mechanical System Redundancy

- The duplication of critical components or functions of a system with the intention of increasing reliability of the system, usually in the case of a backup or failsafe.

- N+1
  - Central Plant Equipment
  - Air Handling Units

- N+2
  - Data Center CRACs

LEED – NC 2009

- ## Energy Efficiency Approach to Mechanical Design
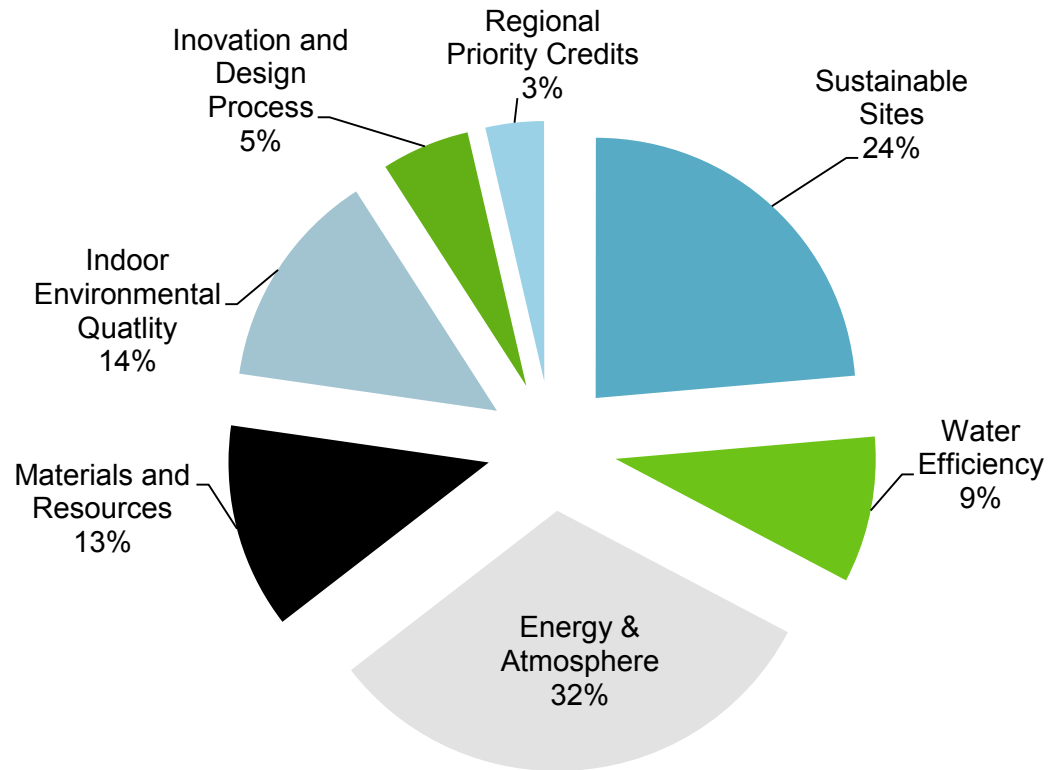
LEED-NC 2009 Point Distribution

HVAC Energy Saving Technologies

- High Efficiency Variable Speed Screw Chillers (~0.3 kW/ton)
- Water-Side Economizers (40%-60% potential savings)
- Chilled Water Reset (~50% potential savings)
- Condenser Water (~25% potential savings)
- High Efficiency Condensing Boilers (80% eff vs. 94% eff)
- Airside Units with Variable Airflow Capabilities (10%-30% potential savings)
- Rack Chilled Water Cooling System (~70% potential savings)

HVAC Systems account for 40%-60% of the energy use in commercial buildings.

Mechanical Systems

- **Plumbing**
  - Low Flow Fixtures
  - Siphonic Roof Drains
  - High Efficiency Water Heaters

- **Fire Protection**
  - Data Center
    - Clean Agent System
  - ECC / EOC Center
    - Wet Pipe Sprinkler System

Electrical

Redundancy ▪ Data Center ▪ Lighting

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City of Raleigh

Pearce Brinkley Cease + Lee | AECOM

Electrical - Power

- **Redundancy, Scalability**

  - ANSI/BICSI Class F3 Power Distribution

  - Dual power paths to Critical Equipment

  - N+1 Generators, Parallel Controls

  - (2) UPS Systems, Bypass

Electrical -

Data center design

- **Low power usage effectiveness (PUE)**

- **Expandability for future growth**

Electrical –
Lighting

- **Energy Efficient**
  - LED vs. Fluorescent

- **Controls**
  - Time, Daylight, Occupancy

Technology

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Technologies in the 911 Center

- **911 CPE – Enhanced, Phase II, Next Gen**

- **PBX/Admin**

- **Two-Way Radio**

- **Computer Aided Dispatch (CAD)**

- **National & State Systems & RMS**

- **Recorder (DVL)**

- **Furniture Systems**

- **Auxiliary – Cameras, Alarms, Security**

- **Geographic Databases**

Technologies & Planning in the EOC

- **Planned around ultimate survivability**

- **Access for large number of users**

- **Systems not in regular use**

- **PBX, IT, Geofile, Display**

- **Accept various agencies' systems**

- **Command & media interfaces**

- **Satellite and other specialized systems**

EOC

- **Dispatch consoles**
  - Interface to Radio base station equipment
  - Usually part of ECC

- **Command level users**
  - User equipment with additional features
  - Interface to Smart phones

- **Interoperable tactical solution**
  - Pre programmed groups or channels
  - Allows direct communications between field officers
  - Monitored by Dispatch in some cases

Tower

- **Size**
  - Structure to support required systems
  - Growth capacity
  - Height to support coverage

- **Support for Microwave**
  - Added structural load
  - Paths require proper engineering for performance and licensing

- **Location**
  - Spacing for Ice fall protection

Mission Critical Facilities

- **Data centers**

- **Command centers**

- **Operation centers**

- **ECC/EOC**

- **Building controls**

- **Environmental controls**

- **Water, Sewer treatment, Power, and Infrastructure**
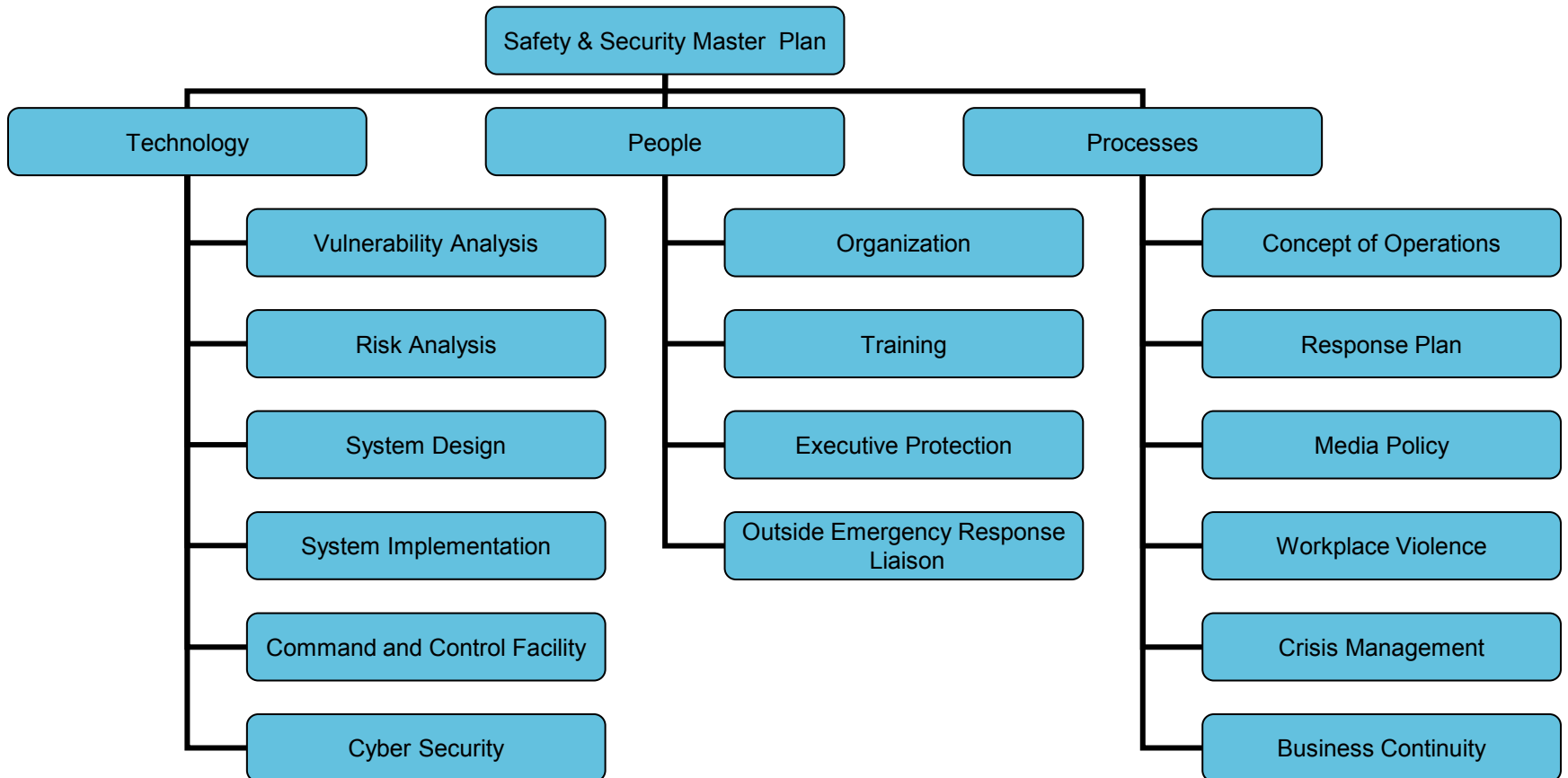
Security

- **Physical Security**
  - **Access control**
  - **Layered access**
  - **Facilities monitoring**
- **Information Technology security**
  - **Physical access**
  - **Network access**
  - **Network isolation**
- **CCTV systems**
  - **Remote monitoring during off hours**

Security Methodology

```
                    ┌──────────────────────────────┐
                    │  Safety & Security Master Plan │
                    └──────────────────────────────┘
         ┌───────────────────┼───────────────────┐
┌─────────────┐      ┌─────────────┐      ┌─────────────┐
│  Technology  │      │   People     │      │  Processes   │
└─────────────┘      └─────────────┘      └─────────────┘
```

| Technology	People	Processes
Vulnerability Analysis	Organization	Concept of Operations
Risk Analysis	Training	Response Plan
System Design	Executive Protection	Media Policy
System Implementation	Outside Emergency Response Liaison	Workplace Violence
Command and Control Facility		Crisis Management
Cyber Security		Business Continuity

AV Systems

- **Video walls**

- **Independent large screen monitors**

- **Video conferencing**

- **Teleconferencing**

- **Acoustic design**

Technology Integration

- **Voice/911**

- **Data Distribution**

- **Dispatch (CAD)**

- **Data Centers/Data Storage Facilities**

- **Wireless/Radio/BDA Systems**

- **Point to Point and Backhaul Wireless**

- **Network pathways, spaces and hardware.**

- **Network Security (CISSP)**

- **Redundancy/Diversity**

- **Standards based design methodology (BICSI, TIA/EIA, ANSI, NEC)**
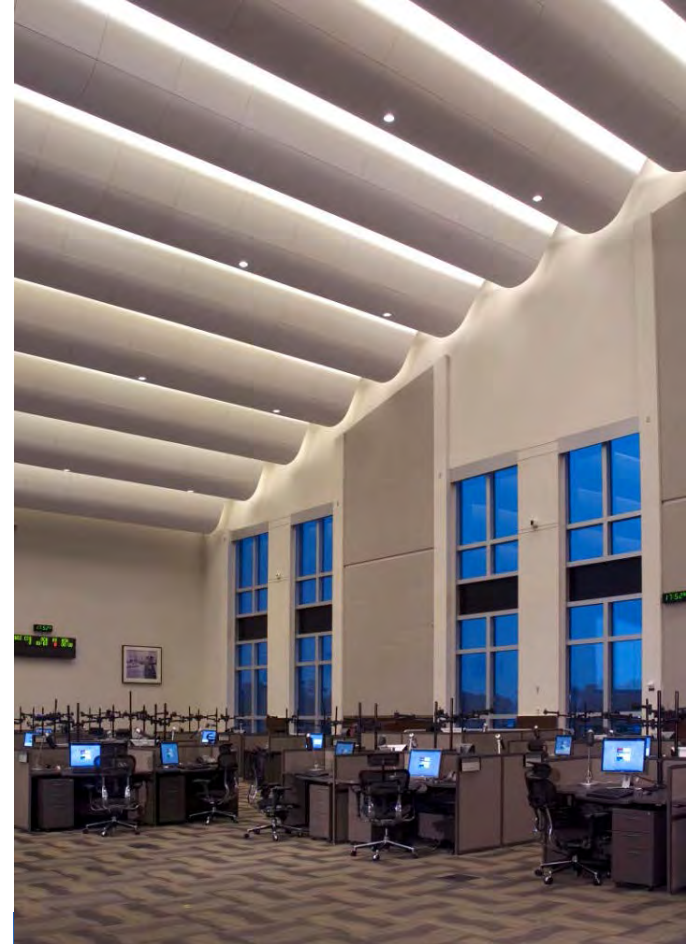
Integrated Operational Management

- **Security**
  - **Master Planning**
  - **ConOps**
  - **Vulnerability Assessments**
  - **Design**
    - Intrusion Detection
    - CCTV Systems
    - PIDS
    - PSIM
  - **Blast Analysis**
  - **Crisis & Response Planning**
  - **Cyber Security**
  - **Business Continuity**

LEED / Sustainability

LEED 2009 for New Construction

❑**Sustainable Sites – 26 points**

❑ **Water Efficiency – 10 Points**

❑ **Energy and Atmosphere – 35 points**

❑ **Materials and Resources – 14 points**

❑ **Indoor Environmental Quality – 15 points**

❑ **Innovation and Design Process – 6 points**

❑ **Regional Priority Credits – 4 points**

Certified 40-49 points; Silver 50-59 points; Gold 60-70 points; Platinum 80-110 points

Sustainable Sites

- ❑ **Site Selection**
- ❑ **Alternative Transportation - Public**
- ❑ **Bicycle Storage & Changing Rooms**
- ❑ **Low- Emitting & Fuel Efficient Vehicles**
- ❑ **Maximize Open Space**
- ❑ **Stormwater Management – Quantity**
- ❑ **Stormwater Management – Quality**
- ❑ **Heat Island Effect - Non–Roof**
- ❑ **Heat Island Effect - Roof**
- ❑ **Light Pollution Reduction**

Water Efficiency

- ❑ **Water Use Reduction - 20% over baseline - required**

- ❑ **Water Efficient Landscaping - 50% reduction, or no potable use**

- ❑ **Water Use Reduction - 30%, 35%, 40%**

- ❑ **Innovative Wastewater Technologies**

Energy and Atmosphere

- ❑ **Optimize Energy Performance - over baseline,12% to 48%, by increments of 2**

- ❑ **Onsite Renewable Energy - 1% to 13% - solar, photovoltaic, wind**

- ❑ **Enhanced Commissioning**

- ❑ **Enhanced Refrigerant Management – prevent ozone depletion**

- ❑ **Measurement and Verification – 1 year post occupancy**

- ❑ **Green Power – 2 year renewable energy contract**

Materials and Resources

- ❑ **Storage and Collection of Recyclables – required**

- ❑ **Construction Waste Management 50% and 75%**

- ❑ **Recycled Content – 10% & 20%**

- ❑ **Regional Materials – 10% & 20%**

- ❑ **Rapidly Renewable Materials**

- ❑ **Certified Wood**

Indoor Environmental Quality

- ❑ **No Smoking in The Building - designated outdoor smoking areas 25 feet from building – Required**
- ❑ **Outdoor air Delivery Monitoring**
- ❑ **Construction IAQ Management Plan –during construction**
- ❑ **Construction IAQ Management Plan – before occupancy**
- ❑ **Low Emitting Finishes: Adhesives and Sealants; Paints and Coatings; Flooring Systems; Composite Wood**
- ❑ **Indoor Chemical and Pollutant Source Control**
- ❑ **Controllability of Systems – Lighting**
- ❑ **Controllability of Systems – Thermal Comfort**
- ❑ **Thermal Comfort Design – ASHRAE Std. 55**
- ❑ **Thermal Comfort Verification**
- ❑ **Daylight and Views - Daylight**
- ❑ **Daylight and Views - Views**

Innovation and Design

❑ **Green Housekeeping**

❑ **Exemplary Performance of Existing Credits – achieve the next performance increment (example 30% regional materials)**

Regional Credits

- ❑ **Stormwater Quantity Control**

- ❑ **Alternative Transportation – Public**

- ❑ **Water Use Reduction by 40%**

- ❑ **Renewable Energy (1%)**

- ❑ **Thermal Comfort Design**

- ❑ **Optimize Energy (28%)**

Cost

Project /Location	Size	Estimated Midpoint of Construction	Cost	Square Foot Cost Adjusted for Raleigh 2014
Utah Highway Patrol, Salt Lake UT	19,144	Jun-99	$1,905,000	$168.32
Public Safety Complex, Glynn County, GA	40,500	Jun-00	$7,600,000	$330.65
Westminster Public Safety Center, Westminster, CO	74,128	Jan-01	$14,000,000	$291.50
Modesto Police Headquarters	40,013	Jan-01	$6,200,000	$201.69
Denver Police Department District Station, Denver CO	41,031	Jan-02	$7,753,779	$275.23
Town of Warrenton Municipal Police Facility, VA	9,000	Jan-03	$1,114,201	$186.90
Edmonton Police service Southeast Div	49,500	Jan-04	8,980,000	$185.82
Rio Grande Valley Sector Headquarters, TX	71,575	Jan-05	$17,389,915	$336.75
Fredrick County Public Safety Building, Winchester, VA	64,500	Feb-07	$14,232,558	$262.63
Grand Junction Public Safety Center, Grand Junction CO	64,216	Aug-11	$19,855,161	$366.33
Average				$253.33

Comparable Police Station Cost

Project /Location	Size	Estimated Midpoint	Cost	Square Foot Cost Adjusted for Raleigh 2014
Valley Emergency Communications Center	30,960	Jul-00	$6,629,000	$304.73
Los Angeles 9-1-1 Centers	58,000	Jul-00	$20,400,000	$407.65
Houston Emergency Center, TX	128,000	Jul-00	$53,000,000	$592.69
Combined Transportation, Emergency & Communication Center, Austin TX	75,000	Jul-02	$23,000,000	$452.63
District of Columbia Unified Communication Center	139,000	Jul-04	$55,000,000	$422.67
Johnson County, KS	41,021	Jul-08	$14,200,000	$293.49
Inland Empire Transportation Management, CA	46,310	Jul-10	$25,000,000	$432.26
Lexington KY PSOC	46,000	Jul-10	$17,000,000	$348.35
Pennsylvania Emergency Management (PEMA)	149,398	Jul-14	$46,750,159	$249.43
Average				$398.97
Mean				$440.21

Comparable ECC & EOC Cost

DESCRIPTION	AREA SQ. FT.	COST PER SQ. FT.	BUILDING AND SITE COST	NUMBER OF STRUCTURED PARKING SPACES REQ'D	PREMIUM COST FOR PARKING STRUCTURE ($13,000/space)	TOTAL
CPSF Building Without Wake County EOC	85,495	$440	$37,617,679	0	$0	$37,617,679
CPSF Building With County EOC	101,270	$440	$44,558,635	122	$1,586,000	$46,144,635
Total Northeast District Police Station	22,950	$255	$5,852,250	0	$0	$5,852,250
Total Cost with All Functions			$50,410,885	437	$5,681,000	$56,271,885

* Cost do not include FF&E or technology .

Preliminary Project Cost

ECC	$11,100,000.00
EOC(combined)	$1,400,000.00
City IT	$28,300,000.00
Traffic Control Center	$1,200,000.00
Facilities	$4,700,000.00
NE District Police	$1,800,000.00
Tower	$500,000.00
Grand Total	$49,000,000.00

Preliminary Technology Cost

Next Steps